PHILIPS AZ-450

MODEL

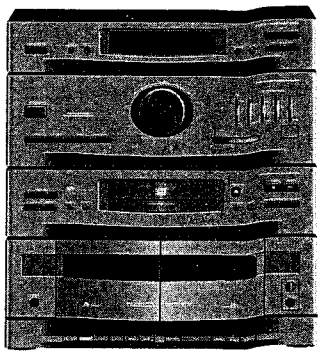
SERVICE MANUAL

Midi System

AS440/20, /20P, /22, /22P, /25, /25P, /37

AS445/20, /21, /25, /30

Service
Service
Service



ServiceManual

COMPACT disc DIGITAL AUDIO

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Annex
Service Manual Record Player DL-40
Service Manual Tape Transport RDN-11

CLASS 1
LASER PRODUCT

Published by Consumer Electronics Printed in The Netherlands

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GB 4822 725 23788

Specification

General:

Mains voltage	:	220V / 50Hz for /20, /22
	:	240V / 50Hz for /25
	:	120V or 230V /50Hz via voltage selector for /21, /30
	:	120V / 60Hz for /37
Power consumption	:	≤ 80 W at maximum output power
	:	≤ 10 W in stand by

Amplifier:

Output power	:	2 x 10W at 6Ω D=10%
Music power	:	2 x 33W at 6Ω
Headphone	:	6,3mm stereo jack 25mW at 32Ω (≡0,9V at 32Ω)
Power stage protection	:	Temperature
Frequency response	:	63 Hz - 14 kHz (-3dB) Limit
	:	63 Hz - 17 kHz (-3dB) Typical value
Tone control		
DBB	:	±6dB at 100 Hz
300 Hz	:	±6dB at 300 Hz
1 kHz	:	±6dB at 1 kHz
4 kHz	:	±6dB at 4 kHz
10 kHz	:	±6dB at 10kHz
Input sensitivity		
PHONO/LINE	:	350 mV

Tuner:

	FM	MW	LW
Tuning range	87,5 - 108 MHz Grid 50 kHz	522 - 1611 kHz (Grid 9kHz) 530 - 1700 kHz (only for /37) (Grid 10kHz)	148 - 284 kHz (Grid 3kHz)
Aerial input	Coax F-Connector 75 Ω	Ferrite antenna	Ferrite antenna
IF	10,7 MHz ± 25 kHz	450 kHz ± 1 kHz	450 kHz ± 1 kHz
Sensitivity Mono : 26dB S/N Stereo : 46dB S/N Search tuning	≤ 4 µV (2 µV typ.) ≤ 45 µV 7 µV typ.	3 mV/m (1,5 mV/m typ.) ≤ 6mV/m	≤ 6 mV/m ≤ 6mV/m
Distortion	≤3% (2% typ.) RF=1mV Δf=75kHz	≤5% (3% typ) RF=100mV/m m=80%	≤5% (3% typ) RF=100mV/m m=80%
Channel separation	≥26dB (30dB typ)	-	-
Image rejection ratio	30 dB (40 dB typ.)	27 dB (30 dB typ.)	40 dB (43 dB typ.)
-3 dB limiting point	≤ 5 µV (2 µV typ.)		

CD unit:

Have to be measured direct on internal connector 1300

Frequency response	:	20 - 20.000 Hz ±2 dB
Output level	:	2V ±3 dB
Signal/noise ratio	:	≥90 dB
Distortion	:	≤1% at 1 kHz
Channel difference	:	≤2 dB at 1 kHz
Channel crosstalk	:	50 dB max.
De emphasis	:	0 or 15/50µs switched automatically by subcode on the disc
Laser		
Output power	:	≤500µW
Wave length	:	780 ± 20 nm

Recorder part:

Tape speed	: 4,76cm/s ±2% in **N**ormal **S**peed
	: 8,5cm/s ±12% in **H**igh **S**peed **D**ubbing
Wow & Flutter	: ≤0,4%
Winding speed	: ≤ 130s for C60 cassette
Erase / Bias system	: AC 60kHz
RIF-shift	: service solution on request
Distortion at 200 nWb/m	: ≤ 5%
Channel difference at PB	: ≤ 3dB
Channel difference overall	: ≤ 3dB
Channel separation	: ≥ 18dB at 1kHz
Track separation	: ≥ 55dB at 1kHz

Phono part:

Power supply	: 12V DC / 80mA
Wow & Flutter	: 0,25% JIS
	: 0,35% DIN
Operating speed	: 33⅓ and 45 rpm
Drive system	: Belt drive with automatic return

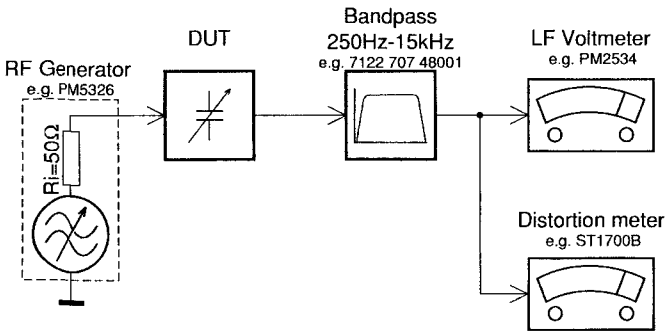
	IEC I	IEC I (dubbing)	IEC II	IEC II (dubbing)	Dubbing HS[3]
Frequency response -8 dB[1]	100Hz - 10kHz	125Hz - 8kHz	100Hz - 10kHz	125Hz - 8kHz	125Hz - 8kHz
Signal to Hiss ratio[2] A-weighted	≥ 45 dB	≥ 45 dB	≥ 45 dB	≥ 45 dB	
Signal to Noise ratio[2] FF-weighted	≥ 40 dB	≥ 40 dB	≥ 40 dB	≥ 40 dB	
Erase attenuation [4]	≥ 55 dB	≥ 55 dB	≥ 55 dB	≥ 55 dB	

[1] typical value [2] at 250 nWb/m [3] at -10dB [4] Use a 1kHz passfilter to minimize the wide band noise component.

The set reacts on following RC5 commands:

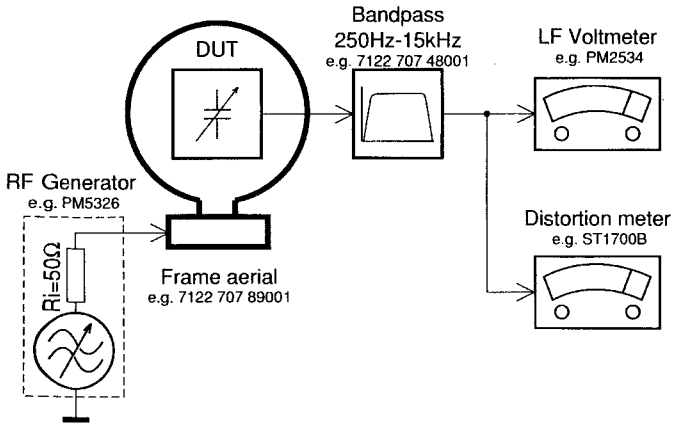
	Systemcode	Commandcode
Stand by	17,20,21	12
Tuner	17	63
Aux/Phono	21	63
CD	20	63
Volume up	16	16
Volume down	16	17
Repeat	20	29
Shuffle	20	28
Scan	20	43
Play (CD)	20	53
Pause (CD)	20	48
Next (CD)	20	32
Previous (CD)	20	33
Search Forward (CD)	20	52
Search Backward (CD)	20	50
Stop (CD)	20	54
Tuning up	17	30
Tuning down	17	31
Preset up	17	32
Preset down	17	33

Tuner FM



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

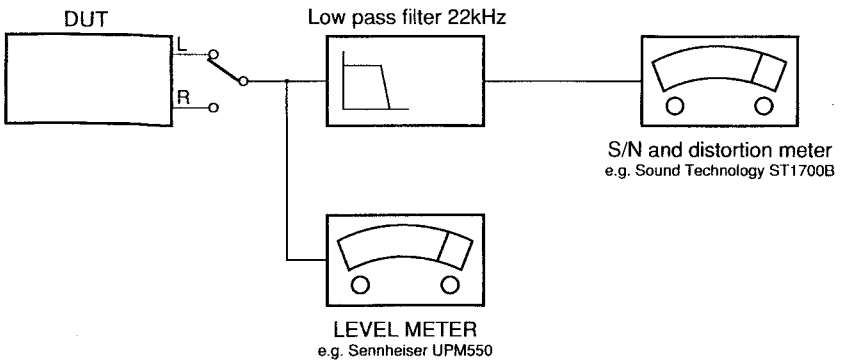
Tuner AM (MW,LW)



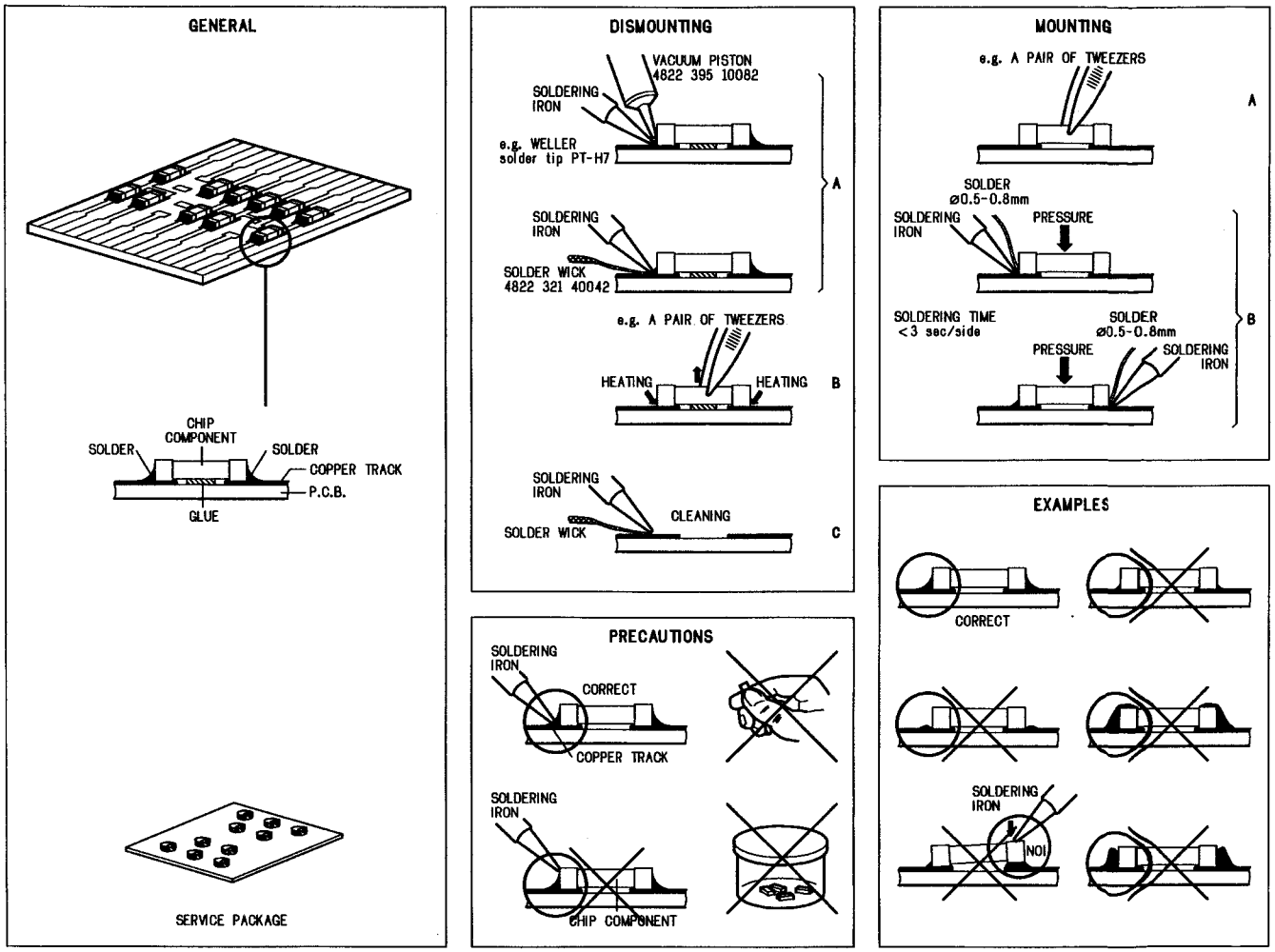
To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

CD

Use Audio Signal Disc SBC429 4822 397 30184 (replaces test disc 3)
L.P.F. = 13th order filter 4822 395 30204



HANDLING CHIP COMPONENTS



(GB) WARNING

All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools at this potential.

(F) ATTENTION

Tous les IC et beaucoup d´autres semi-conducteurs sont sensibles aux décharges statiques (ESD). Leur longévite pourrait être considérablement écourtée par le fait qu´aucune précaution nést prise à leur manipulation.
Lors de réparations, s´assurer de bien être relié au même potentiel que la masse de l´appareil et enfileer le bracelet serti d´une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l´on utilise soient également à ce potentiel.

ESD

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.
Sorgen Sie dafür, daß sie im Reparaturfall über ein Puls-armband mit Widerstand mit dem Massepotential des Gerätes verbunden sind.
Halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

(NL) WAARSCHUWING

Alle IC´s en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen vermindern. Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cautela alla loro manipolazione. Durante le riparationi occorre quindi essere collegato allo stesso potenziale che quello della massa delápparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvor-schriften zu beachten. Der Originalzustand des Gerätes darf nicht verändert werden. Für Reparaturen sind Original-ersatzteile zu verwenden.

(I)
Le norme di sicurezza estigono che l´apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambiago identici a quelli specificati.

(F)
Les normes de sécurité exigent que l´appareil soit remis à l´état d´origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

(S) Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

(DK) Advarsel !

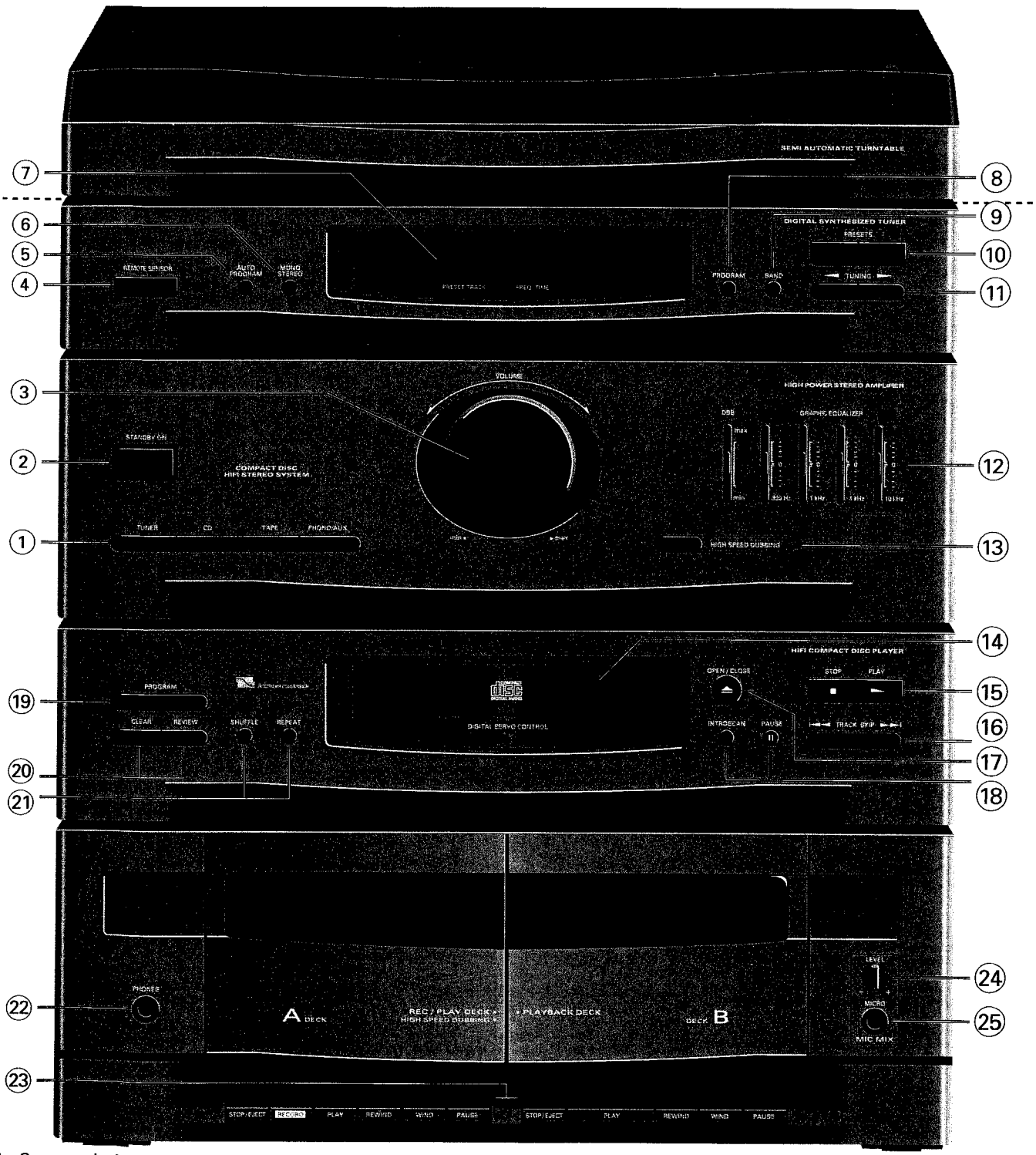
Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

(SF) Varoitus !

Avatussa laitteessa ja suojalukituksen ollessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen !

(F)
"Pour votre sécurite, ces documents doivent être utilisés par des spécialistes agrées, seuls habilités à réparer votre appareil en panne".

Connection & Controls



1 Source selector — see page 25, 26
- Tuner 1440
- CD 1438
- Tape 1444
- Phono/Aux 1437

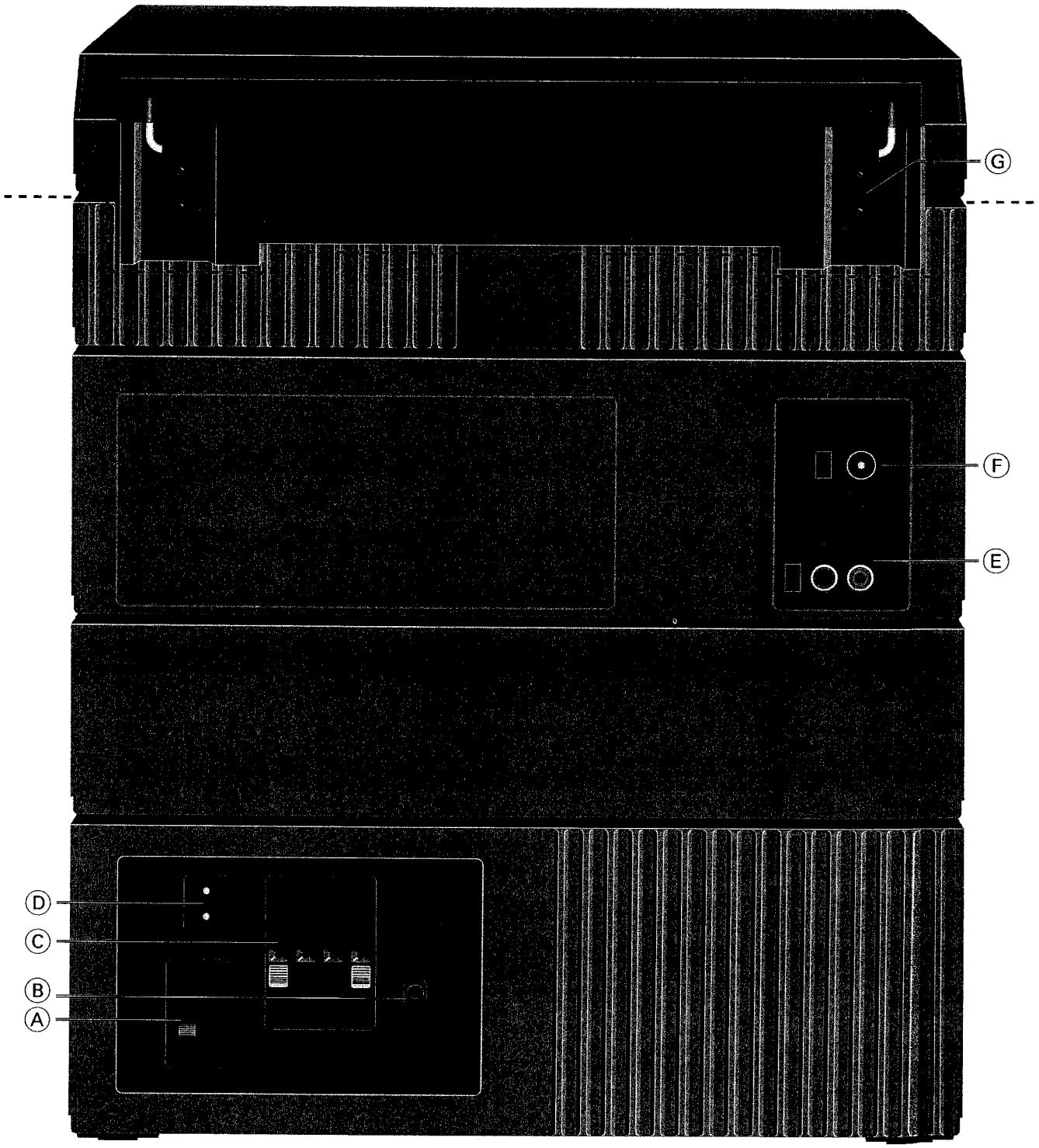
2 Stand by ....1439 — see page 29, 30
3 Volume ....3480 — see page 25, 26
4 Remote sensor ....7422 — see page 25, 26
5 Auto Program ....1436 — see page 29, 30
6 Mono/Stereo ....1448 — see page 29, 30
7 Display ....1415 — see page 29, 30
8 Program (Tuner) ....1435 — see page 29, 30
9 Band ....1434 — see page 29, 30
10 Presets — see page 29, 30
- Up 1425
- Down 1426

11 Tuning — see page 29, 30
- Up 1421
- Down 1422

12 Graphic Equalizer — see page 25, 26
- 100Hz/DBB 3485
- 300Hz 3484
- 1kHz 3483
- 4kHz 3482
- 10kHz 3481

13 High Speed Dubbing ....1433 — see page 29, 30
14 CD Tray
15 Stop (CD) ....1424 — see page 29, 30
- Play (CD) ....1428 — see page 29, 30

16 Track skip (CD)
- ⏮ ....1431 — see page 29, 30
- ⏭ ....1432 — see page 29, 30



17	Open/Close (CD) 1427	see page 29, 30
18	Introscan (CD) 1429	see page 29, 30
	Pause (CD) 1430	see page 29, 30
19	Program (CD) 1441	see page 29, 30
20	Clear (CD) 1446	see page 29, 30
21	Review (CD) 1447	see page 29, 30
22	Headphone socket.....1410	see page 25, 26
23	Tape transport keys.....mechanical	
24	Micro Mix Level.....3905	see page 22
25	Microphone socket 1900	see page 22

A	Voltage selector.....1260	see page 39
B	Phono supply.....1305	see page 37, 38
C	Speaker terminal 1304	see page 37, 38
D	Mains socket.....1255	see page 39
E	Aux / Phono sockets.....1408	see page 25, 26
F	FM aerial socket 1101	
	for ECO 4 Tuner	see page 40
	FM aerial socket 1110	
	for Tuner 92	see page 46

Service Hints

Version Table (Quick reference)

	AS440 /00, /20,/20P	AS440 /02, /22,/22P	AS440 /05, /25,/25P	AS440 /17, /37,	AS445 /00, /20	AS445 /01, /21	AS445 /05, /25	AS445 /10, /30
Mains cord								
4822 321 10954								x
4822 321 10831	x	x			x	x		
4822 321 10883				x				
4822 321 10918			x				x	
Mains transformer								
4822 146 31239	x	x			x			
4822 146 31234				x				
4822 146 31235						x		x
4822 146 31254			x				x	
Mains socket								
4822 265 31015	x	x	x		x	x	x	x
4822 265 31016				x				
Voltage selector								
4822 272 10269						x		x
IR Remote control								
4822 218 10513	x	x	x	x	x	x	x	x
Loudspeaker box								
4822 445 10359	x	x	x		x		x	
4822 445 10361				x				
4822 445 10362						x		x
Tuner								
ECO4 Tuner	x		x	x	x	x	x	x
Tuner 92		x						
Record player								
DL-40					x	x	x	x
Micro Mix function								
available						x		x

Service tools

TORX screwdriver set SBC 163 4822 395 50145
Audio signal disc SBC 429 4822 397 30184
Test disc 5 (disc without errors)
Test disc 5A (disc with dropout errors, black spots and finger prints)
SBC 426/426A 4822 397 30096

Burn in test disc (65 min. 1kHz signal at -30dB level without "pause") 4822 397 30155
Universal **test cassette Fe** SBC 420 4822 397 30071
Universal **test cassette CrO_2** SBC 419 4822 397 30069

Instruction for use (all versions except /37) 4822 736 21737
Instruction for use (for /37) 4822 736 21738

Dismantling of:

CD Brick : see page 52

Front assy

* Remove top cover as shown in picture 1.
* Remove right side of the cabinet (10 screws)
* Remove 3 bottom screws and 3 screws from left side wall on front side.
* Remove 1 screw to CD metal support on rear.
* Release 2 snaps (bottom-front) and turn whole front assy aside.

Tape Transports

* Separate Front assy as described above
* Loosen Recorder assy (6 screws)

Power Board

* Remove top cover as shown in picture 1
* Remove rear part of cabinet (20 screws).
* Loosen power board (4 screws).
* Take power board and place it behind the set.

Remarks: Cable to headphone socket has to be disconnected.
Remove CD brick if necessary.

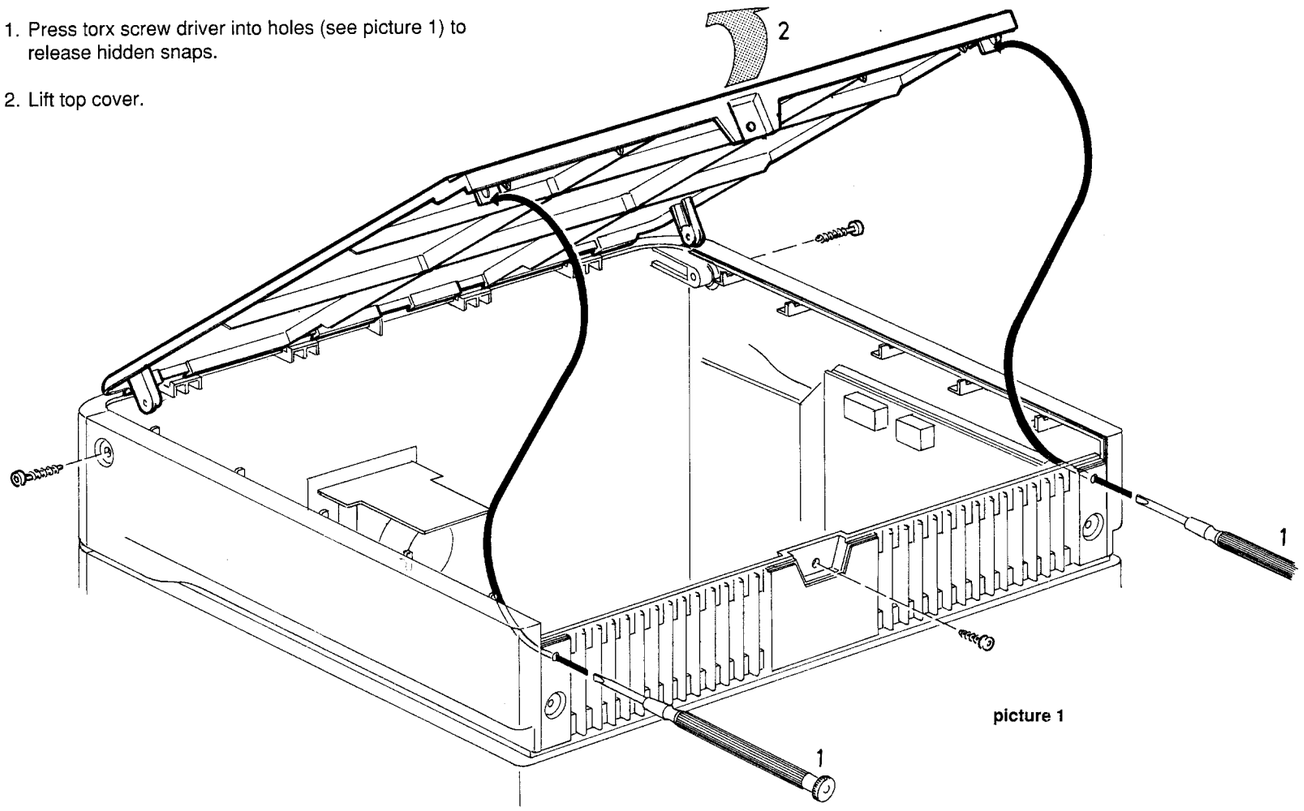
Dismantling Hints

Dismantling of Top Cover

Remove 3x screws.

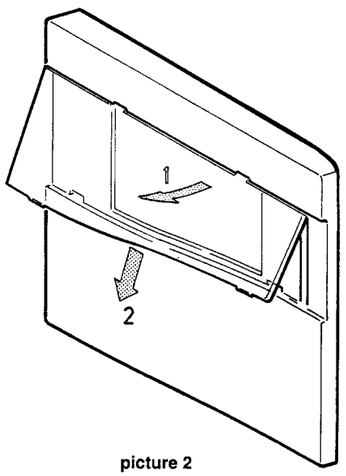
1. Press torx screw driver into holes (see picture 1) to release hidden snaps.

2. Lift top cover.



picture 1

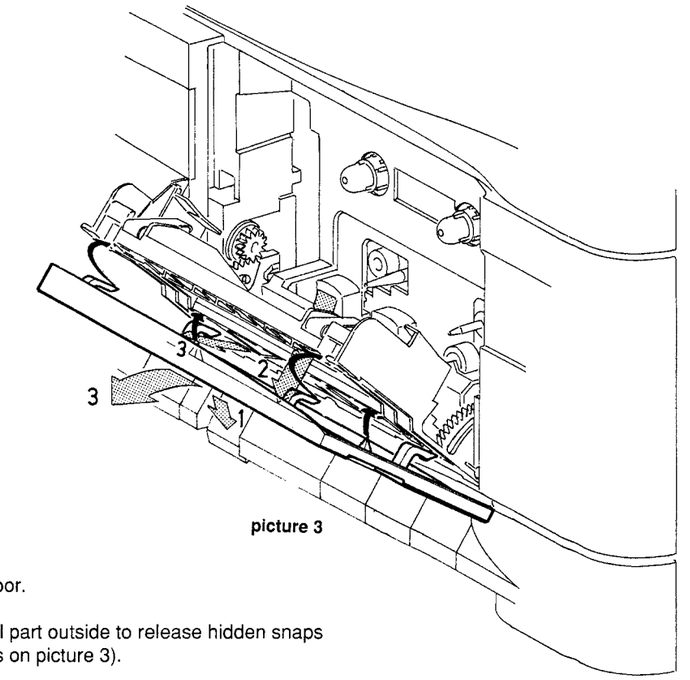
Dismantling Window of Cassette Door



picture 2

1) Press the window outside as shown in picture 2. You don´t need any tool.

Dismantling Cassette Door Ornamental Part



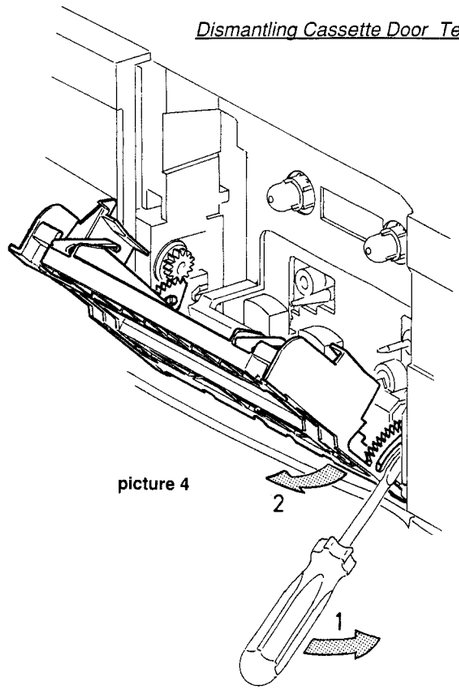
picture 3

1) Open cassette door.

2) Press ornamental part outside to release hidden snaps (see black arrows on picture 3).

3) Pull ornamental part upwards.

Dismantling Cassette Door Technical Part



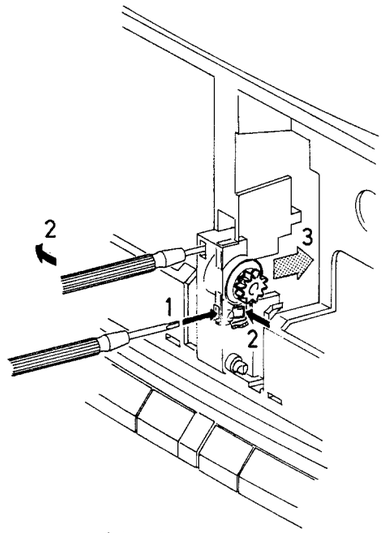
picture 4

Remove ornamental part first.

1) Bend tooth segment with a screw driver to release snap as shown in picture 4.

2) Pull cassette door outside.

Dismantling of Damper



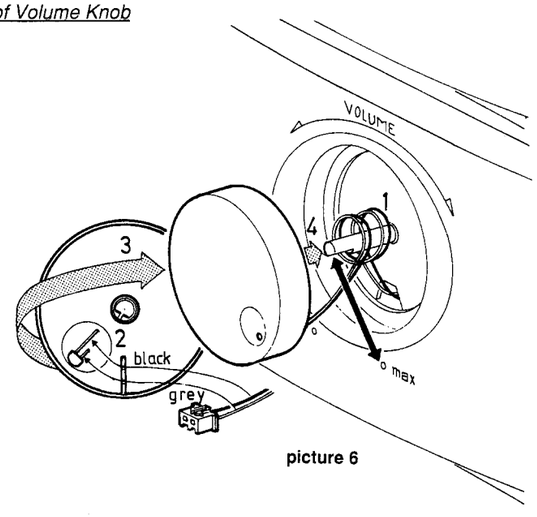
picture 5

Remove Tape Transports and bracket (506) first.

1+2) Release two snaps as shown in picture 5.

3) Pull damper outside.

Mounting of Volume Knob



picture 6

1) Turn Volume pot to max. (clockwise)

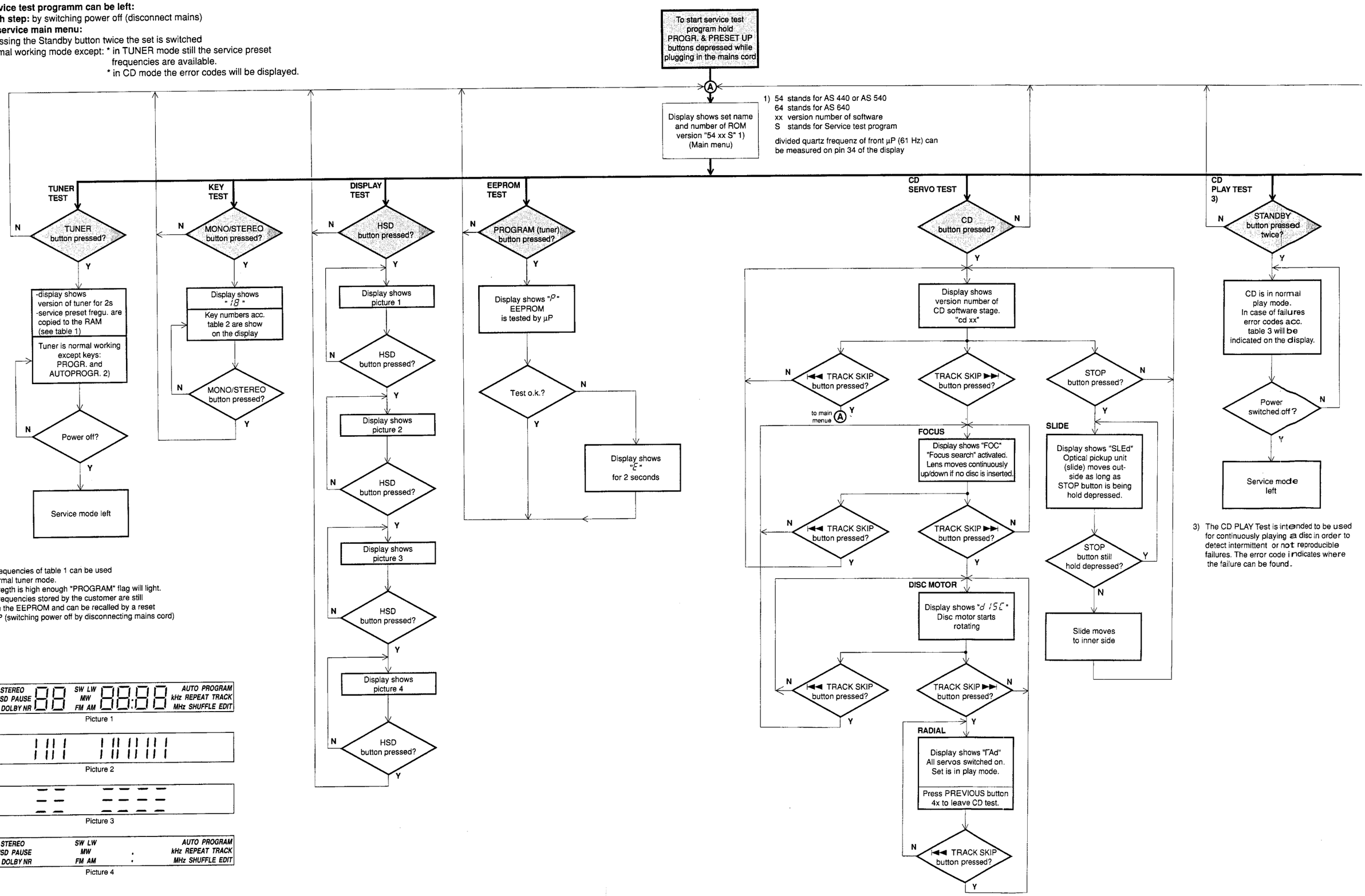
2) Pay attention to the polarity of the LED.

3) Turn the cable two times clockwise onto the axle.

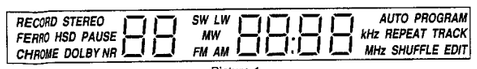
4) Insert the knob.

SERVICE TEST PROGRAM

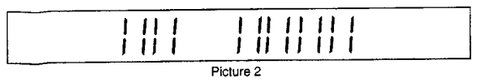
The service test programm can be left:
- **at each step:** by switching power off (disconnect mains)
- **from service main menu:**
  by pressing the Standby button twice the set is switched to normal working mode except: * in TUNER mode still the service preset frequencies are available.
  * in CD mode the error codes will be displayed.

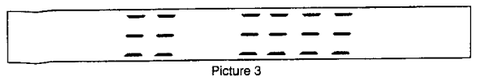

To start service test program hold PROGR. & PRESET UP buttons depressed while plugging in the mains cord
A
Display shows set name and number of ROM version "54 xx S" 1) (Main menu)
1) 54 stands for AS 440 or AS 540
64 stands for AS 640
xx version number of software
S stands for Service test program
divided quartz frequenz of front µP (61 Hz) can be measured on pin 34 of the display
TUNER TEST
TUNER button pressed?
-display shows version of tuner for 2s
-service preset fregu. are copied to the RAM (see table 1)
Tuner is normal working except keys: PROGR. and AUTOPROGR. 2)
Power off?
Service mode left
KEY TEST
MONO/STEREO button pressed?
Display shows " 18 "
Key numbers acc. table 2 are show on the display
MONO/STEREO button pressed?
DISPLAY TEST
HSD button pressed?
Display shows picture 1
HSD button pressed?
Display shows picture 2
HSD button pressed?
Display shows picture 3
HSD button pressed?
Display shows picture 4
HSD button pressed?
EEPROM TEST
PROGRAM (tuner) button pressed?
Display shows "P" EEPROM is tested by µP
Test o.k.?
Display shows "E" for 2 seconds
CD SERVO TEST
CD button pressed?
Display shows version number of CD software stage. "cd xx"
TRACK SKIP ◄◄ button pressed?
TRACK SKIP ►► button pressed?
STOP button pressed?
to main menue
A
FOCUS
Display shows "FOC" "Focus search" activated. Lens moves continuously up/down if no disc is inserted.
TRACK SKIP ◄◄ button pressed?
TRACK SKIP ►► button pressed?
SLIDE
Display shows "SLEd" Optical pickup unit (slide) moves out-side as long as STOP button is being hold depressed.
STOP button still hold depressed?
Slide moves to inner side
DISC MOTOR
Display shows "d 15C" Disc motor starts rotating
TRACK SKIP ◄◄ button pressed?
TRACK SKIP ►► button pressed?
RADIAL
Display shows "rAd" All servos switched on. Set is in play mode.
Press PREVIOUS button 4x to leave CD test.
TRACK SKIP ◄◄ button pressed?
CD PLAY TEST 3)
STANDBY button pressed twice?
CD is in normal play mode. In case of failures error codes acc. table 3 will be indicated on the display.
Power switched off?
Service mode left

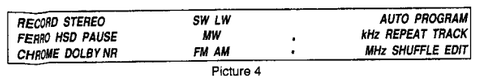
2) Preset frequencies of table 1 can be used as in normal tuner mode.
If fieldstregth is high enough "PROGRAM" flag will light.
Preset frequencies stored by the customer are still stored in the EEPROM and can be recalled by a reset of the µP (switching power off by disconnecting mains cord)



Picture 1


Picture 2


Picture 3



Picture 4

3) The CD PLAY Test is intended to be used for continuously playing a disc in order to detect intermittent or not reproducible failures. The error code indicates where the failure can be found.

To start service test program hold PROGR. & PRESET UP buttons depressed while plugging in the mains cord

A

Display shows set name and number of ROM version "54 xx S" 1) (Main menu)

1) 54 stands for AS 440 or AS 540
64 stands for AS 640
xx version number of software
S stands for Service test program

divided quartz frequenz of front µP (61 Hz) can be measured on pin 34 of the display

N

Display shows "E" for 2 seconds

CD SERVO TEST

CD button pressed? N / Y

Display shows version number of CD software stage. "cd xx"

TRACK SKIP ◄◄ button pressed? N / Y → to main menue A

TRACK SKIP ►► button pressed? N / Y

STOP button pressed? N / Y

FOCUS

Display shows "FOC" "Focus search" activated. Lens moves continuously up/down if no disc is inserted.

TRACK SKIP ◄◄ button pressed? N / Y

TRACK SKIP ►► button pressed? N / Y

DISC MOTOR

Display shows "d ISC" Disc motor starts rotating

TRACK SKIP ◄◄ button pressed? N / Y

TRACK SKIP ►► button pressed? N / Y

RADIAL

Display shows "rAd" All servos switched on. Set is in play mode.

Press PREVIOUS button 4x to leave CD test.

TRACK SKIP ◄◄ button pressed? N / Y

SLIDE

Display shows "SLEd" Optical pickup unit (slide) moves out-side as long as STOP button is being hold depressed.

STOP button still hold depressed? Y / N

Slide moves to inner side

CD PLAY TEST 3)

STANDBY button pressed twice? N / Y

CD is in normal play mode. In case of failures error codes acc. table 3 will be indicated on the display.

Power switched off? N / Y

Service mode left

3) The CD PLAY Test is intended to be used for continuously playing a disc in order to detect intermittent or not reproducible failures. The error code indicates where the failure can be found.

VOLUME POTENTIOMETER TEST

TUNING UP ► button pressed ? N / Y

◄ TUNING DOWN button pressed ? N / Y

Volume knob turns clockwise Display shows "U"

Volume knob turns counter clockwise Display shows "d"

With the TUNING UP and TUNING DOWN buttons the volume pot. can be controlled alternatively

Any other button pressed? N / Y

Volume motor stops. Back to main menu or switch over directly to another test which can be activated by the choosen key

CLEAR EEPROM 4)

AUTOPROGRAM button pressed? N / Y

Display shows "C" for 2 seconds EEPROM is cleared

4) Use this mode only in case of a µP "hang up" to clear the EEPROM.
Attention: All preset frequencies stored by the customer will be cleared.

	VERSION						
	EUR	EAS	USA	EUS	OSE	OSS	
PRESET	Europe 3-band	East Europe 3-band	USA 2-band	Europe 4-band	Oversea 2-band	Oversea 3-band	UNIT
1	87,5	65,81	87,5	87,5	87,5	87,5	MHz
2	108	74	108	108	108	108	MHz
3	98	87,5	98	98	98	98	MHz
4	89,7	108	89,7	89,7	89,7	89,7	MHz
5	93	98	93	93	93	93	MHz
6	104,9	89,7	104,9	104,9	104,9	104,9	MHz
7	522	93	530	522	530	530	kHz
8	1611	104,9	1710	1611	1710	1710	kHz
9	540	522	540	540	540	540	kHz
10	549	1611	550	549	550	550	kHz
11	558	540	560	558	560	560	kHz
12	1494	549	1500	1494	1500	1500	kHz
13	153	558	1600	153	1600	1600	kHz
14	279	1494	1000	279	1000	3900	kHz
15	156	153		156		12100	kHz
16	198	279		198		4250	kHz
17	270	156		270		8000	kHz
18	999	198		5900		11900	kHz
19		270		18100		1000	kHz
20		999		6200			kHz
21				17000			kHz
22				12000			kHz
23				999			kHz

table 1

Key activated	Display shows	Key activated	Display shows
Tuning up	01	Autoprogram	17
Tuning down	03	Mono / Stereo	18
Preset up	04	Tuner	19
Preset down	02	Stand by	20
Dolby [1]	05	Tape	21
Band	06	Phono / Aux	22
Program(Tuner)	07	CD	23
Fe/Cr [1]	08	—	—
Introscan	09	Repeat	25
Pause (CD)	10	Shuffle	26
≪ Track skip	11	Review	27
Track skip ≫	12	Clear	28
HS dubbing	13	—	—
Open/Close	14	Edit [1]	30
Stop (CD)	15	—	—
Play (CD)	16	Program (CD)	32

table 2

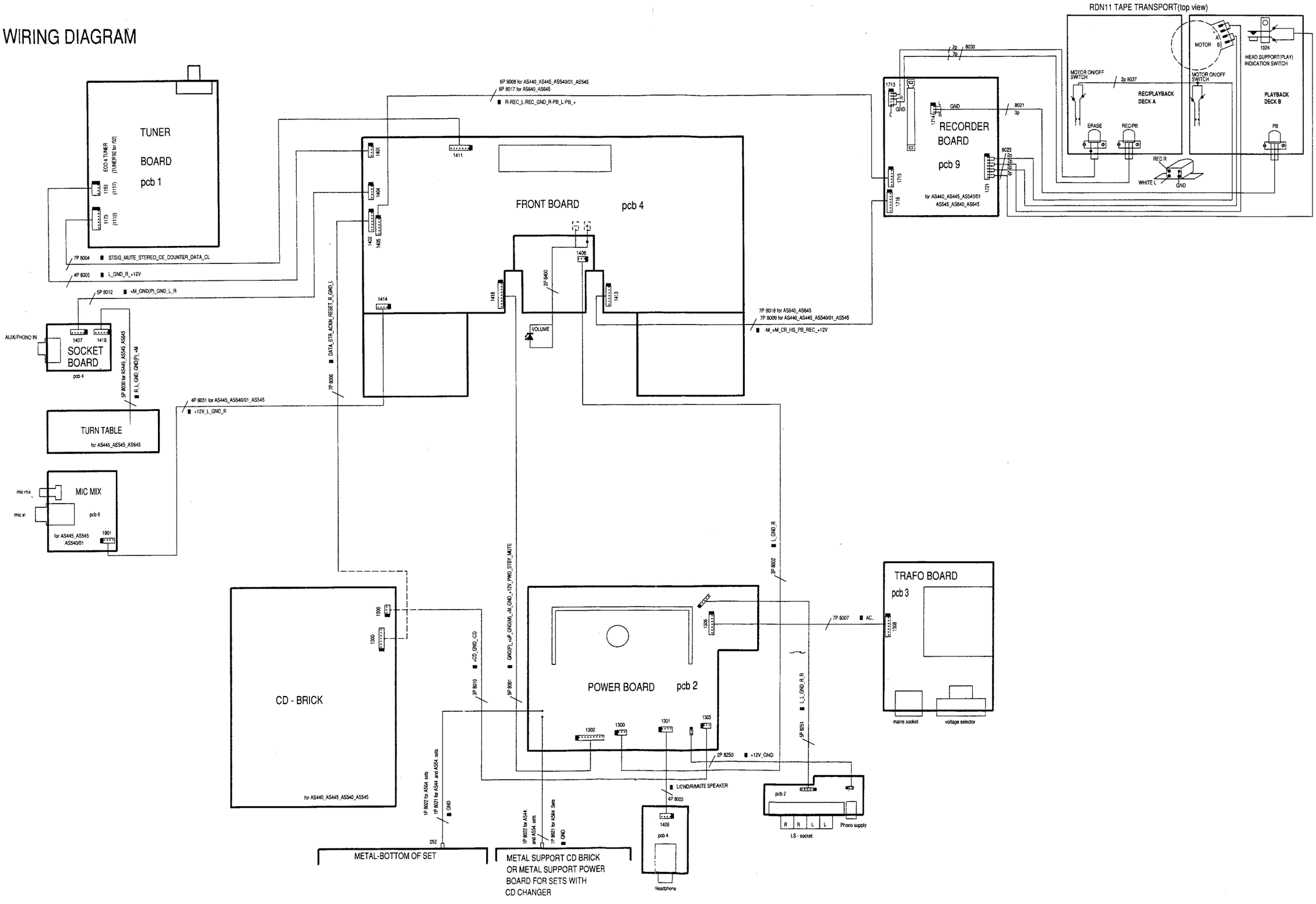
If a key is activated at the remote control ⌐ ⌙ is shown additionally to the key number as long as the key is hold depressed.

1) key not available in all versions.

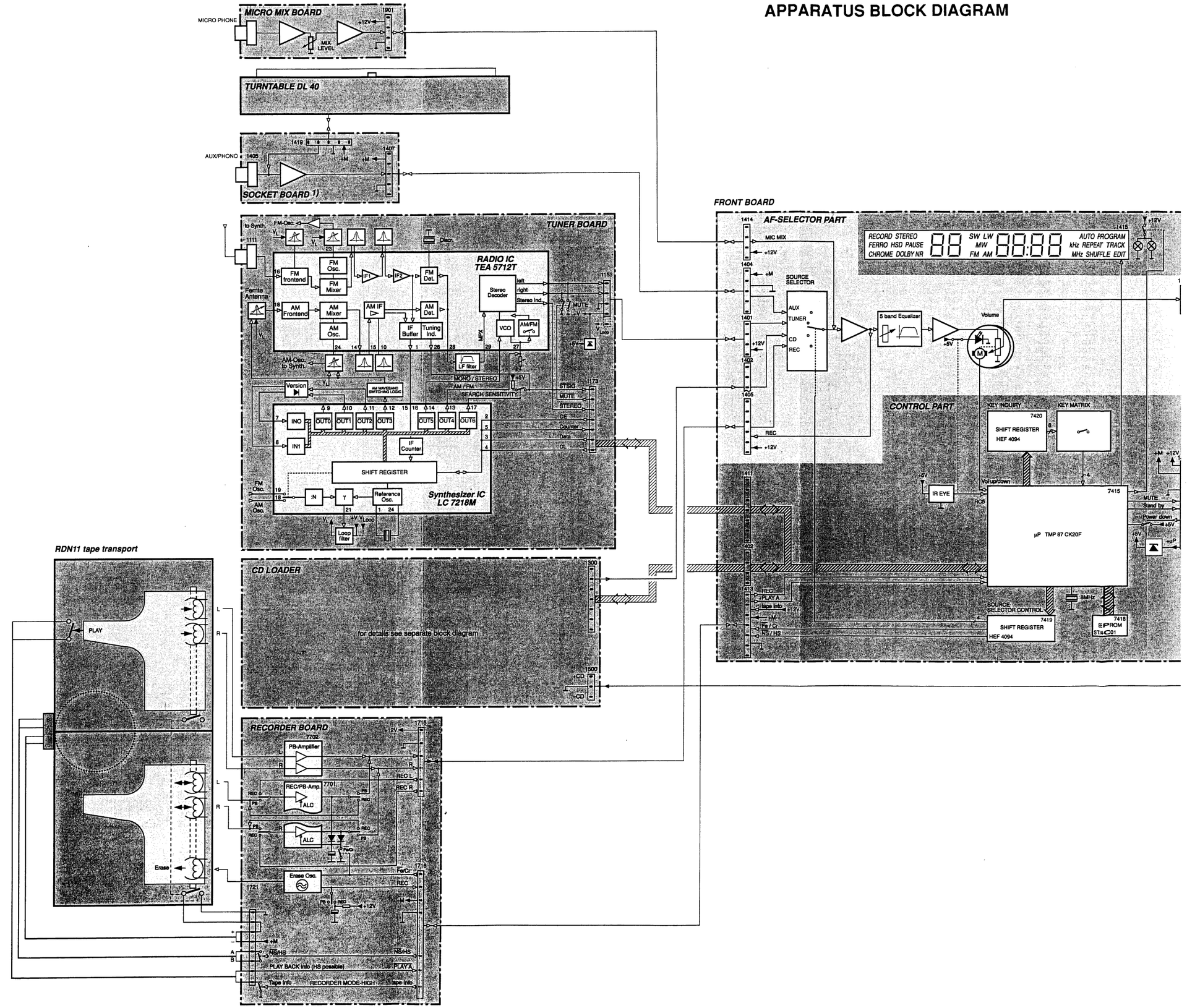
Error code shown on the display		Description
Er	1002	Focus error
Er	1007	Subcode error, no valid subcode
Er	1008	TOC error, out of lead-in area while reading TOC
Er	1009	CD4 + decoder error
Er	1010	Radial error
Er	1012	Fatal sledge error
Er	1013	Turntable motor error
Er	1030	Too many grooves to jump
Er	1031	Search error
Er	1032	Search binary error
Er	1033	Search index error
Er	1034	Search time error
Er	1037	Selector error
Er	1050	Edit calculation error
Er	1051	Edit track count error
Er	1052	Edit Optimal error

table 3

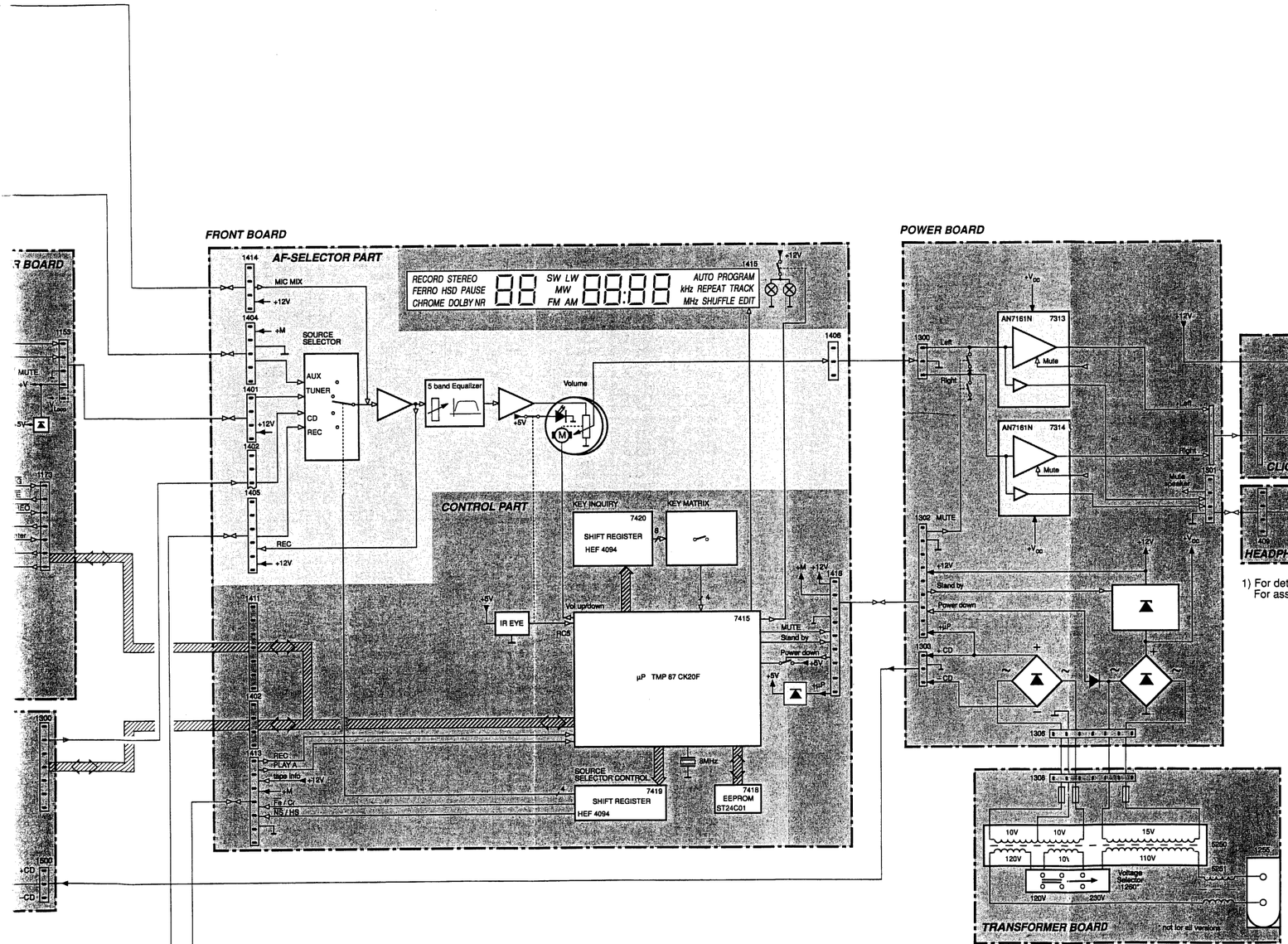
WIRING DIAGRAM



APPARATUS BLOCK DIAGRAM

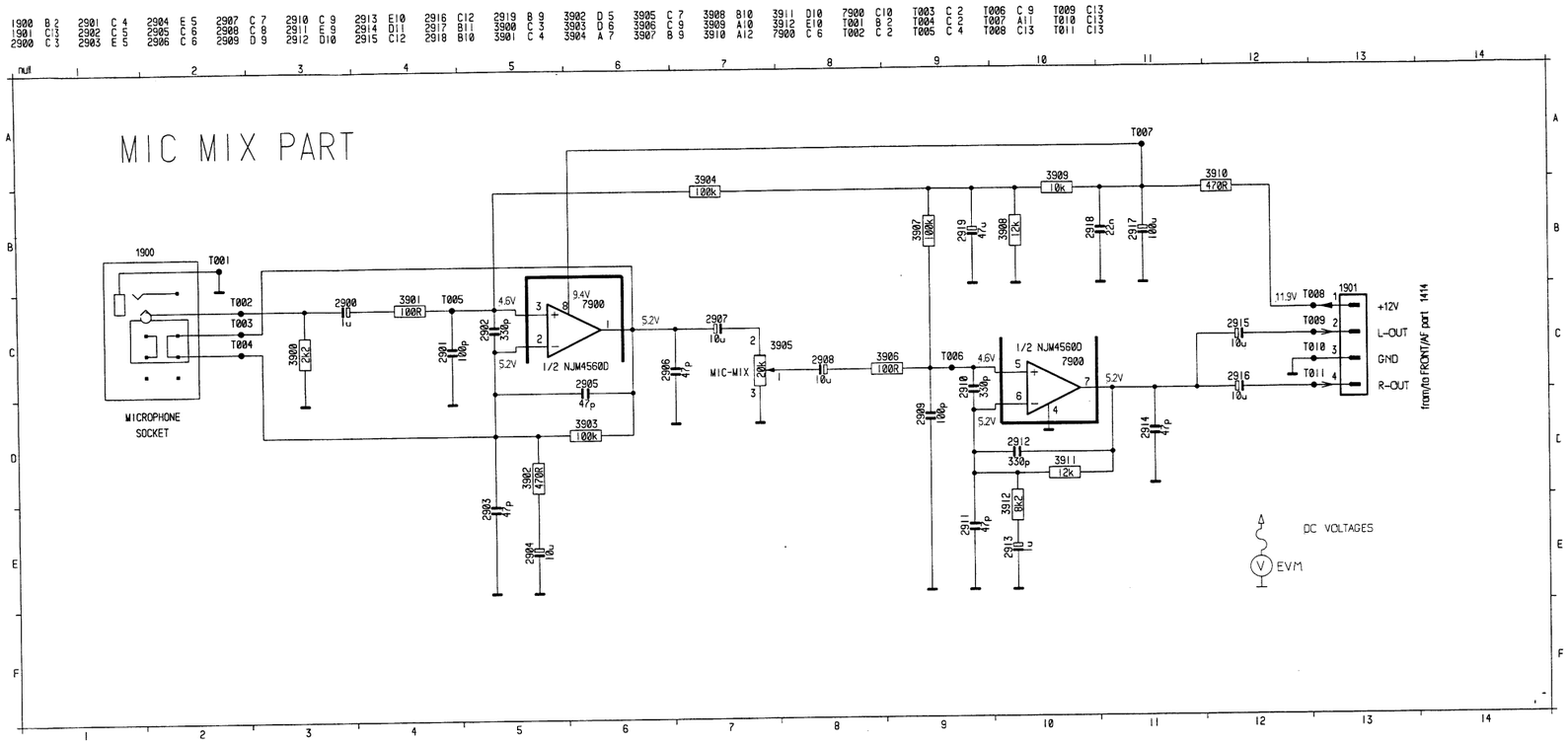


APPARATUS BLOCK DIAGRAM



1) For detailed circuit diagram see FRONT/AF part.
For assembly drawing see FRONT BOARD.

Micro Mix only in versions with Record Player

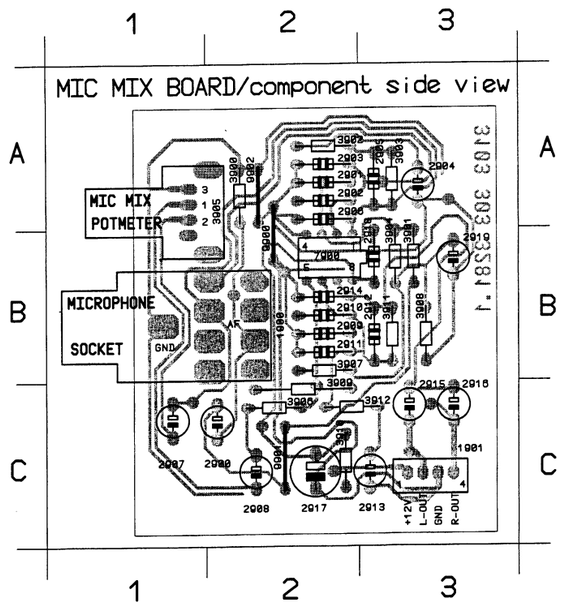


1900 B 2	2901 C 4	2904 E 5	2907 C 7	2910 C 9	2913 E10
1901 C 3	2902 C 4	2905 E 5	2908 C 8	2911 E 9	2914 D12
2900 C 3	2903 E 5	2906 C 6	2909 D 9	2912 D10	2915 C12
					2918 B10

2916 C12	2919 B 9	3902 D 5	3905 C 7	3908 B10	3911 D10
2917 B11	3900 C 4	3903 D 5	3906 C 9	3909 A10	3912 E10
3901 C 4	3904 A 7	3907 B 9	3910 A12	7900 C 6	T001 B 3
					T002 C 2

T003 C 2	T006 C 9	T009 C13	1900 B 1	2905 A 3
T004 C 2	T007 A11	T010 C13	1901 C 3	2906 A 2
T005 C 4	T008 C13	T011 C13	2900 C 2	2907 C 1
			2901 A 2	2908 C 2
			2902 A 2	2909 B 2
			2903 A 2	2910 B 2
			2904 A 3	2911 B 2

2912 B 3	2919 B 3	3906 C 2	7900 B 2	
2913 C 3	3900 A 2	3907 B 2	9900 B 2	
2914 B 2	3901 B 3	3908 B 3	9901 C 2	
2915 C 3	3902 A 2	3909 C 2	9902 A 2	
2916 C 3	3903 A 3	3910 C 2		
2917 C 2	3904 B 3	3911 B 3		
2918 B 3	3905 A 1	3912 C 3		



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3603 C 10	3485 D 11	2484 E 3	0003 A 9		
3604 E 7	3486 E 3	2485 F 8	0004 A 9		
3605 F 7	3487 E 4	2486 C 13	0005 D 7		
3606 F 7	3488 E 3	2487 E 1	1401 A 1		
3607 C 9	3489 E 2	2488 C 1	1402 C 1		
3608 B 5	3490 E 2	2489 H 9	1404 B 1		
3601 B 7	3491 F 8	2470 I 9	1405 D 1		
3602 B 5	3492 F 7	2471 H 8	1406 E 8		
3605 E 3	3493 E 7	2472 I 8	1407 H 9		
3601 D 2	3494 E 7	2473 I 9	1408 I 8		
3602 C 3	3495 E 8	2475 A 2	1409 I 5		
3603 D 3	3496 E 8	2476 F 12	1410 I 6		
3604 C 3	3497 E 6	2477 I 10	1411 A 4		
3605 D 4	3498 E 6	2502 E 5	1413 F 9		
3606 C 2	3499 B 8	2503 D 5	1414 F 1		
3607 D 3	3500 A 4	2504 B 6	1415 A 5		
3608 C 3	3501 C 9	2505 A 11	1416 B 6		
3609 D 3	3502 C 9	2507 B 12	1417 B 7		
3610 C 3	3503 A 11	2508 A 3	1418 F 5		
3611 D 4	3504 A 12	2509 A 3	1419 H 10		
3612 C 2	3505 A 12	2510 A 4	1421 B 13		
3613 D 3	3506 C 5	2512 E 5	1422 B 12		
3614 C 3	3507 B 4	2513 E 5	1424 I 12		
3615 D 2	3508 B 4	2514 C 4	1425 A 13		
3616 C 4	3516 A 3	2552 I 9	1426 A 12		
3618 B 12	3517 A 3	2553 I 9	1427 I 10		
3619 B 12	3526 D 5	2554 I 5	1428 I 13		
3620 F 12	3528 B 2	2555 I 5	1429 I 10		
3621 F 12	3530 A 3	2556 D 13	1430 I 11		
3622 C 11	3531 A 3	2557 D 13	1431 I 12		
3623 C 11	3532 A 3	2558 C 12	1432 I 13		
3624 C 11	3533 A 3	3401 A 1	1433 F 10		
3625 C 11	3534 A 3	3402 A 1	1434 B 11		
3627 A 12	3535 A 3	3403 A 1	1435 B 11		
3628 C 9	3536 A 2	3404 A 1	1436 B 3		
3631 F 5	3537 B 4	3405 C 1	1437 F 4		
3642 D 2	3538 B 4	3406 C 1	1438 F 2		
3650 C 9	3539 A 4	3407 C 1	1439 E 1		
3653 F 7	3540 E 6	3408 C 1	1440 F 1		
3655 D 1	3552 F 4	3409 D 2	1441 I 1		
3656 E 1	3554 A 13	3410 D 2	1442 I 3		
7403 C 12	3555 A 12	3413 B 1	1443 I 3		
7405 F 6	3556 A 13	3414 B 1	1444 F 3		
7407 E 2	3557 A 13	3415 I 9	1445 I 1		
7408 F 8	3558 B 11	3416 I 8	1447 I 2		
7409 F 7	3559 B 11	3417 D 3	1448 B 3		
7410 F 7	3560 B 11	3418 C 3	2401 A 2		
7411 F 7	3562 D 5	3419 D 4	2402 A 2		
7412 F 6	3563 D 5	3420 C 2	2403 D 3		
7413 F 8	3564 A 11	3421 D 3	2404 B 2		
7418 C 4	3565 A 2	3422 C 3	2405 D 4		
7419 E 4	3568 B 9	3423 D 2	2406 B 2		
7420 B 11	3572 A 11	3424 C 3	2407 D 2		
7421 D 5	3573 F 9	3425 D 4	2408 B 2		
7422 B 1	3574 F 9	3426 C 4	2409 C 2		
7423 D 9	3575 G 9	3427 F 2	2410 B 3		
7424 D 9	3576 F 11	3428 E 3	2411 C 3		
7425 E 5	3577 E 9	3431 F 2	2412 B 2		
7426 A 11	3578 F 9	3432 F 3	2413 C 4		
7427 D 5	3579 F 10	3433 F 1	2414 B 2		
7432 D 9	3580 E 10	3434 F 2	2415 C 3		
7433 E 10	3581 E 10	3435 E 2	2416 B 3		
7440 E 9	3585 B 4	3436 E 3	2417 C 4		
7445 C 2	3586 C 5	3437 D 2	2418 B 3		
7446 C 2	3587 F 5	3438 D 2	2419 F 2		
7447 I 9	3589 B 11	3439 D 12	2420 E 3		
7448 I 9	3590 D 4	3440 D 12	2421 E 2		
8400 D 7	3591 B 11	3441 C 13	2422 F 3		
9402 A 6	3592 D 4	3442 D 13	2423 B 2		
9406 B 2	3593 B 11	3443 D 13	2424 B 4		
9408 E 8	3594 B 5	3444 D 13	2425 F 2		
9412 F 5	3595 B 5	3445 D 12	2426 F 3		
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9414 A 8	3597 B 5	3447 D 12	2428 E 3		
9415 A 8	3598 A 2	3448 D 12	2429 E 13		
9416 B 6	3601 E 2	3449 D 11	2430 E 13		
9417 A 4	3602 F 3	3450 D 11	2431 E 12		
9420 E 3	3603 F 2	3451 D 11	2432 E 13		
9421 A 5	3604 F 3	3452 D 11	2433 D 12		
9422 A 5	3605 C 1	3455 E 10	2434 D 13		
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9424 C 5	3607 C 2	3457 E 11	2436 E 12		
9425 D 9	3608 C 2	3458 E 11	2437 D 12		
9426 E 10	3609 D 2	3459 E 12	2438 D 12		
9427 C 8	3610 D 10	3460 E 12	2439 E 11		
9428 C 9	3612 B 5	3461 E 12	2440 E 11		
9429 G 3	3613 C 7	3462 E 13	2441 D 11		
9430 F 4	3615 A 2	3463 C 11	2442 D 11		
9432 C 1	3616 E 7	3464 D 12	2443 E 10		
9433 C 1	3617 G 7	3465 C 12	2444 E 11		
9434 F 2	3618 F 6	3466 C 12	2445 D 11		
9435 B 2	3620 B 6	3469 C 12	2446 D 10		
9436 D 9	3621 E 1	3470 C 12	2447 C 4		
9437 C 2	3622 D 1	3471 E 13	2448 C 4		
9438 C 3	3623 E 2	3472 E 13	2449 C 13		
9439 C 6	3624 E 1	3473 C 13	2450 C 12		
9440 F 3	3649 H 9	3474 D 13	2451 C 11		
9443 G 2	3650 I 9	3475 F 2	2452 C 12		
9444 G 2	3651 H 10	3476 E 3	2453 D 13		
9445 G 2	3652 I 9	3477 F 6	2454 B 13		
9446 G 2	3653 H 8	3478 F 7	2455 C 11		
9447 D 3	3654 I 8	3480 D 7	2458 C 12		
9448 F 5	3655 I 9	3481 D 13	2460 D 3		
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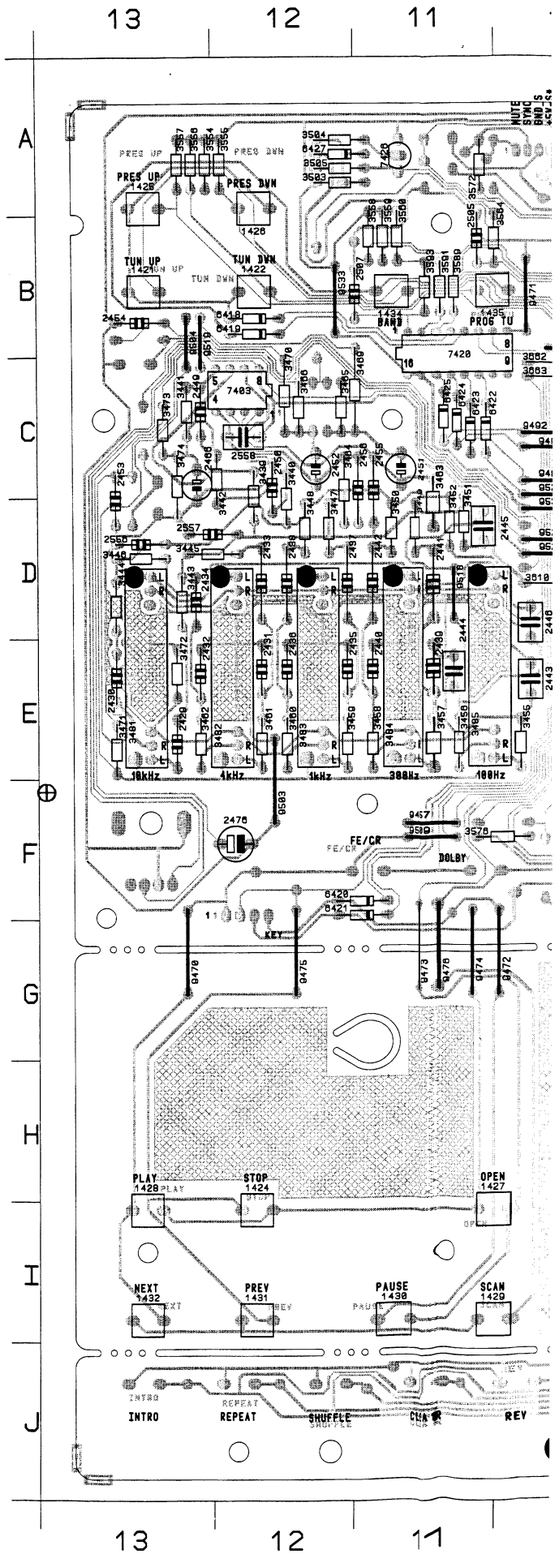
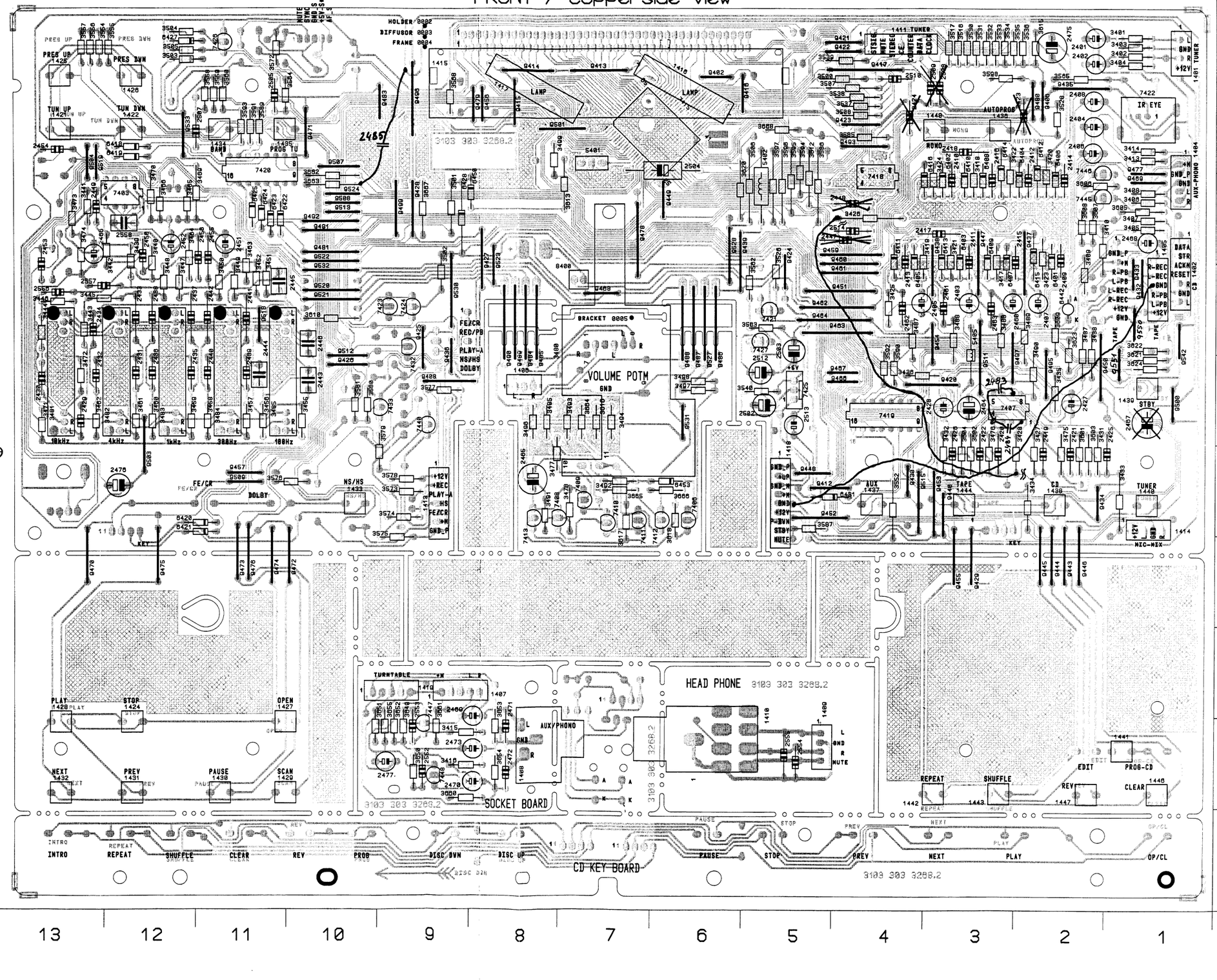


FRONT / copperside view



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3664	E	7	3486	E	3	2465	F	8	0004	A	9
3665	F	7	3487	E	4	2466	C	13	0005	D	7
3666	F	7	3488	E	3	2467	E	1	1401	A	1
3667	C	9	3489	E	2	2468	C	1	1402	C	1
3668	B	5	3490	E	2	2469	H	9	1404	B	1
5401	B	7	3491	F	8	2470	I	9	1405	D	1
5402	B	5	3492	F	7	2471	H	8	1406	E	8
5405	E	3	3493	E	7	2472	I	8	1407	H	9
5401	D	2	3494	E	7	2473	I	9	1408	I	8
5402	C	3	3495	E	8	2475	A	2	1409	I	5
5403	D	3	3496	E	8	2476	F	12	1410	I	6
5404	C	3	3497	E	6	2477	I	10	1411	A	4
5405	D	4	3498	E	6	2502	E	5	1413	F	9
5406	C	2	3499	B	8	2503	D	5	1414	F	1
5407	D	3	3500	A	4	2504	B	6	1415	A	5
5408	C	3	3501	C	9	2505	A	11	1416	B	6
5409	D	3	3502	C	9	2507	B	12	1417	B	7
5410	C	3	3503	A	11	2508	A	3	1418	F	5
5411	D	4	3504	A	12	2509	A	3	1419	H	10
5412	C	2	3505	A	12	2510	A	4	1421	B	13
5413	D	3	3506	C	5	2512	E	5	1422	B	12
5414	C	3	3507	B	4	2513	E	5	1424	I	12
5415	D	2	3508	B	4	2514	C	4	1425	A	13
5416	C	4	3516	A	3	2552	I	9	1426	A	12
5418	B	12	3517	A	3	2553	I	9	1427	I	10
5419	B	12	3526	D	5	2554	I	5	1428	I	13
5420	F	12	3528	B	2	2555	I	5	1429	I	10
5421	F	12	3530	A	3	2556	D	13	1430	I	11
5422	C	11	3531	A	3	2557	D	13	1431	I	12
5423	C	11	3532	A	3	2558	C	12	1432	I	13
5424	C	11	3533	A	3	3401	A	1	1433	F	10
5425	C	11	3534	A	3	3402	A	1	1434	B	11
5427	A	12	3535	A	3	3403	A	1	1435	B	11
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5431	F	5	3537	B	4	3405	C	1	1437	F	4
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7407	E	2	3557	A	13	3415	I	9	1445	I	1
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7410	F	7	3560	B	11	3418	C	3	2401	A	2
7411	F	7	3562	D	5	3419	D	4	2402	A	2
7412	F	6	3563	D	5	3420	C	2	2403	D	3
7413	F	8	3564	A	11	3421	D	3	2404	B	2
7418	C	4	3565	A	2	3422	C	3	2405	D	4
7419	E	4	3568	B	9	3423	D	2	2406	B	2
7420	B	11	3572	A	11	3424	C	3	2407	D	2
7421	D	5	3573	F	9	3425	D	4	2408	B	2
7422	B	1	3574	F	9	3426	C	4	2409	C	2
7423	D	9	3575	G	9	3427	F	2	2410	B	3
7424	D	9	3576	F	11	3428	E	3	2411	C	3
7425	E	5	3577	E	9	3431	F	2	2412	B	2
7426	A	11	3578	F	9	3432	F	3	2413	C	4
7427	D	5	3579	F	10	3433	F	1	2414	B	2
7432	D	9	3580	E	10	3434	F	2	2415	C	3
7433	E	10	3581	E	10	3435	E	2	2416	B	3
7440	E	9	3585	B	4	3436	E	3	2417	C	4
7445	C	2	3586	C	5	3437	D	2	2418	B	3
7446	C	2	3587	F	5	3438	D	2	2419	F	2
7447	I	9	3589	B	11	3439	D	12	2420	E	3
7448	I	9	3590	D	4	3440	D	12	2421	E	2
8400	D	7	3591	B	11	3441	C	13	2422	F	3
9402	A	6	3592	D	4	3442	D	13	2423	B	2
9405	B	2	3593	B	11	3443	D	13	2424	B	4
9408	E	8	3594	B	5	3444	D	13	2425	F	2
9412	F	5	3595	B	5	3445	D	12	2426	F	3
9413	A	7	3596	B	5	3446	D	13	2427	E	2
9414	A	8	3597	B	5	3447	D	12	2428	E	3
9415	A	8	3598	A	2	3448	D	12	2429	E	13
9416	B	6	3601	E	2	3449	D	11	2430	E	13
9417	A	4	3602	F	3	3450	D	11	2431	E	12
9420	E	3	3603	F	2	3451	D	11	2432	E	13
9421	A	5	3604	F	3	3452	D	11	2433	D	12
9422	A	5	3605	C	1	3455	E	10	2434	D	13
9423	B	4	3606	C	1	3456	E	11	2435	E	12
9424	C	5	3607	C	2	3457	E	11	2436	E	12
9425	D	9	3608	C	2	3458	E	11	2437	D	12
9426	E	10	3609	D	2	3459	E	12	2438	D	12
9427	C	8	3610	D	10	3460	E	12	2439	E	11
9428	C	9	3612	B	5	3461	E	12	2440	E	11
9429	G	3	3613	C	7	3462	E	13	2441	D	11
9430	F	4	3615	A	2	3463	C	11	2442	D	11
9432	C	1	3616	E	7	3464	D	12	2443	E	10
9433	C	1	3617	G	7	3465	C	12	2444	E	11
9434	F	2	3618	F	6	3466	C	12	2445	D	11
9435	B	2	3620	B	6	3469	C	12	2446	D	10
9436	D	9	3621	E	1	3470	C	12	2447	C	4
9437	C	2	3622	D	1	3471	E	13	2448	C	4
9438	C	3	3623	E	2	3472	E	13	2449	C	13
9439	C	6	3624	E	1	3473	C	13	2450	C	12
9448	F	3	3649	H	9	3474	D	13	2451	C	11
9443	G	2	3650	I	9	3475	F	2	2452	C	12
9444	G	2	3651	H	10	3476	E	3	2453	D	13
9445	G	2	3652	I	9	3477	F	8	2454	B	13
9446	G	2	3653	H	8	3478	F	7	2455	C	11
9447	D	3	3654	I	8	3480	D	7	2456	C	12
9448	F	5	3655	I	9	3481	D	13	2458	D	3
9449	C	8	3656	I	9	3482	D	12	2461	D	3
9450	D	2	3661	I	9	3483	D	12	2462	D	4

FRONT / AF PART

SOURCE SELECTOR

BUFFER AMPLIFIER

EQUALIZER

PRE - AMPLIFIER

RECORD MUTE

HEADPHONE SOCKET

VOLUME MOTOR DRIVER

SOCKET BOARD

AUX/PHONO

from/to TUNER (1530/117)

from/to CD-BOX or CHANGER

from/to RECORDER-BOARD (075)

from/to BUILT-IN-TURNTABLE

from/to MIC-MIX

from/to POWER-BOARD (1500)

VOLUME LEFT

VOLUME RIGHT

VOL_UP/DOWN

GND_P

GND

+12V

GND_M

+5V

+M

REC-MUTE

DATA_1

STR

ACKN

RESET

TUNER

CD

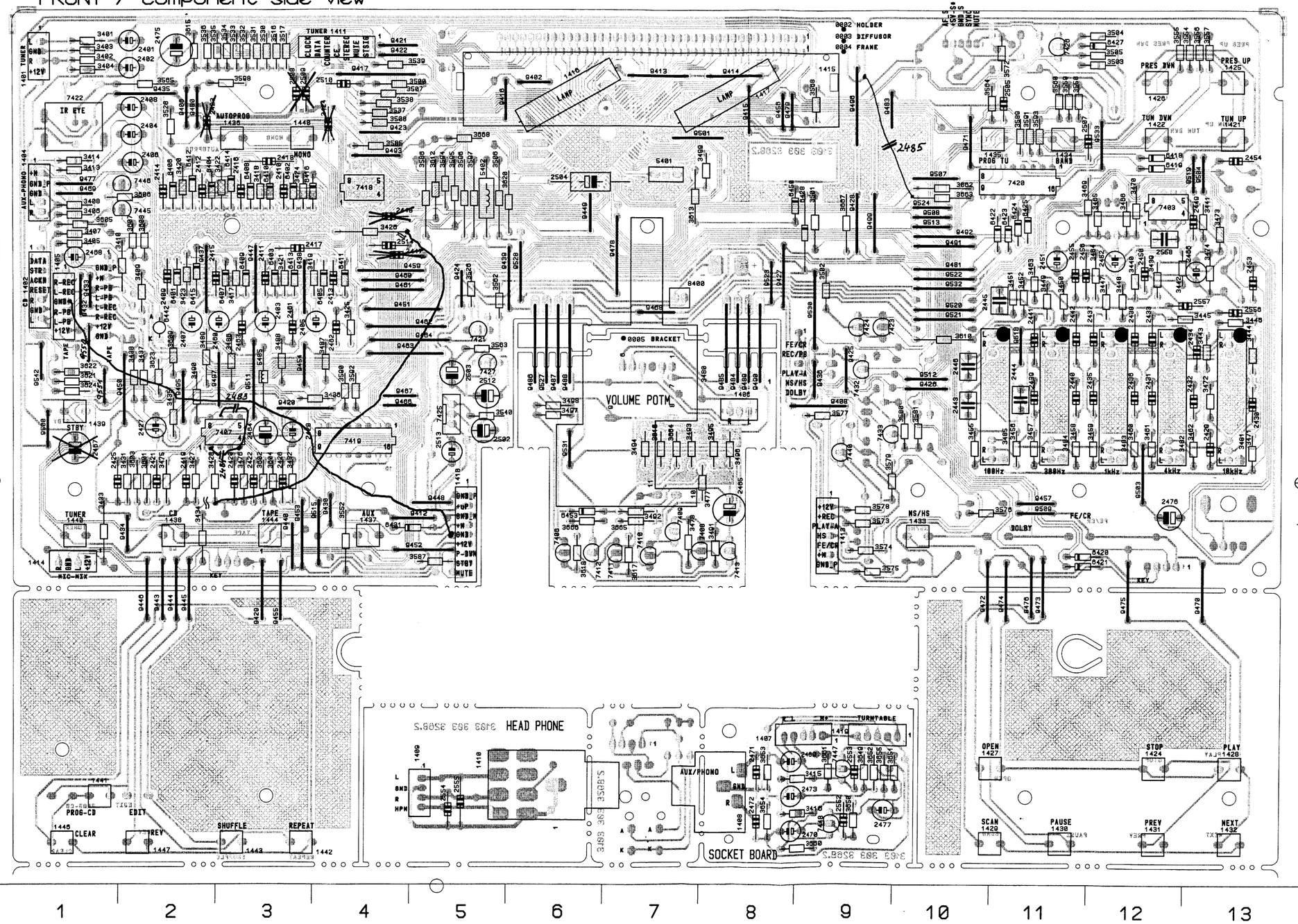
TAPE

AUX

from and to CONTROL PART

DC VOLTAGES measured in tuner mode

FRONT / component side view



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0003	A	9	2404	E	3	3485	D	11	3563	C	10				
0004	A	9	2405	F	8	3486	E	3	3564	E	7				
0005	D	7	2406	C	13	3487	E	4	3565	F	7				
1401	A	1	2407	E	1	3488	E	3	3566	F	7				
1402	C	1	2408	C	1	3489	E	2	3567	C	9				
1404	B	1	2409	H	9	3490	E	2	3568	B	5				
1405	C	1	2470	I	9	3491	F	8	5401	B	7				
1406	E	8	2471	H	8	3492	F	7	5402	B	5				
1407	H	9	2472	I	8	3493	E	7	5405	E	3				
1408	I	8	2473	I	9	3494	E	7	6401	D	2				
1409	I	5	2475	A	2	3495	E	8	6402	C	3				
1410	I	6	2476	F	12	3496	E	8	6403	D	3				
1411	A	4	2477	I	10	3497	E	6	6404	C	3				
1413	F	9	2502	E	5	3498	E	6	6405	D	4				
1414	F	1	2503	D	5	3499	B	8	6406	C	2				
1415	A	5	2504	B	6	3500	A	4	6407	D	3				
1416	B	6	2505	A	11	3501	C	9	6408	C	3				
1417	B	7	2507	B	12	3502	C	9	6409	D	3				
1418	F	5	2508	A	3	3503	A	11	6410	C	3				
1419	H	10	2509	A	3	3504	A	12	6411	D	4				
1421	B	13	2510	A	4	3505	A	12	6412	C	2				
1422	B	12	2512	E	5	3506	C	5	6413	D	3				
1424	I	12	2513	E	5	3507	B	4	6414	C	3				
1425	A	13	2514	C	4	3508	B	4	6415	D	2				
1426	A	12	2552	I	9	3516	A	3	6416	C	4				
1427	I	10	2553	I	9	3517	A	3	6418	B	12				
1428	I	13	2554	I	5	3526	D	5	6419	B	12				
1429	I	10	2555	I	5	3528	B	2	6420	F	12				
1430	I	11	2556	D	13	3530	A	3	6421	F	12				
1431	I	12	2557	D	13	3531	A	3	6422	C	11				
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1433	F	10	3401	A	1	3533	A	3	6424	C	11				
1434	B	11	3402	A	1	3534	A	3	6425	C	11				
1435	B	11	3403	A	1	3535	A	3	6427	A	12				
1436	B	3	3404	A	1	3536	A	2	6428	C	9				
1437	F	4	3405	C	1	3537	B	4	6431	F	5				
1438	F	2	3406	C	1	3538	B	4	6442	D	2				
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1440	F	1	3408	C	1	3540	E	6	6453	F	7				
1441	I	1	3409	D	2	3552	F	4	6455	D	1				
1442	I	3	3410	D	2	3554	A	13	6456	E	1				
1443	I	3	3413	B	1	3555	A	12	7403	C	12				
1444	F	3	3414	B	1	3556	A	13	7405	F	8				
1446	I	1	3415	I	9	3557	A	13	7407	E	2				
1447	I	2	3416	I	8	3558	B	11	7408	F	8				
1448	B	3	3417	D	3	3559	B	11	7409	F	7				
2401	A	2	3418	C	3	3560	B	11	7410	F	7				
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2403	D	3	3420	C	2	3563	D	5	7412	F	8				
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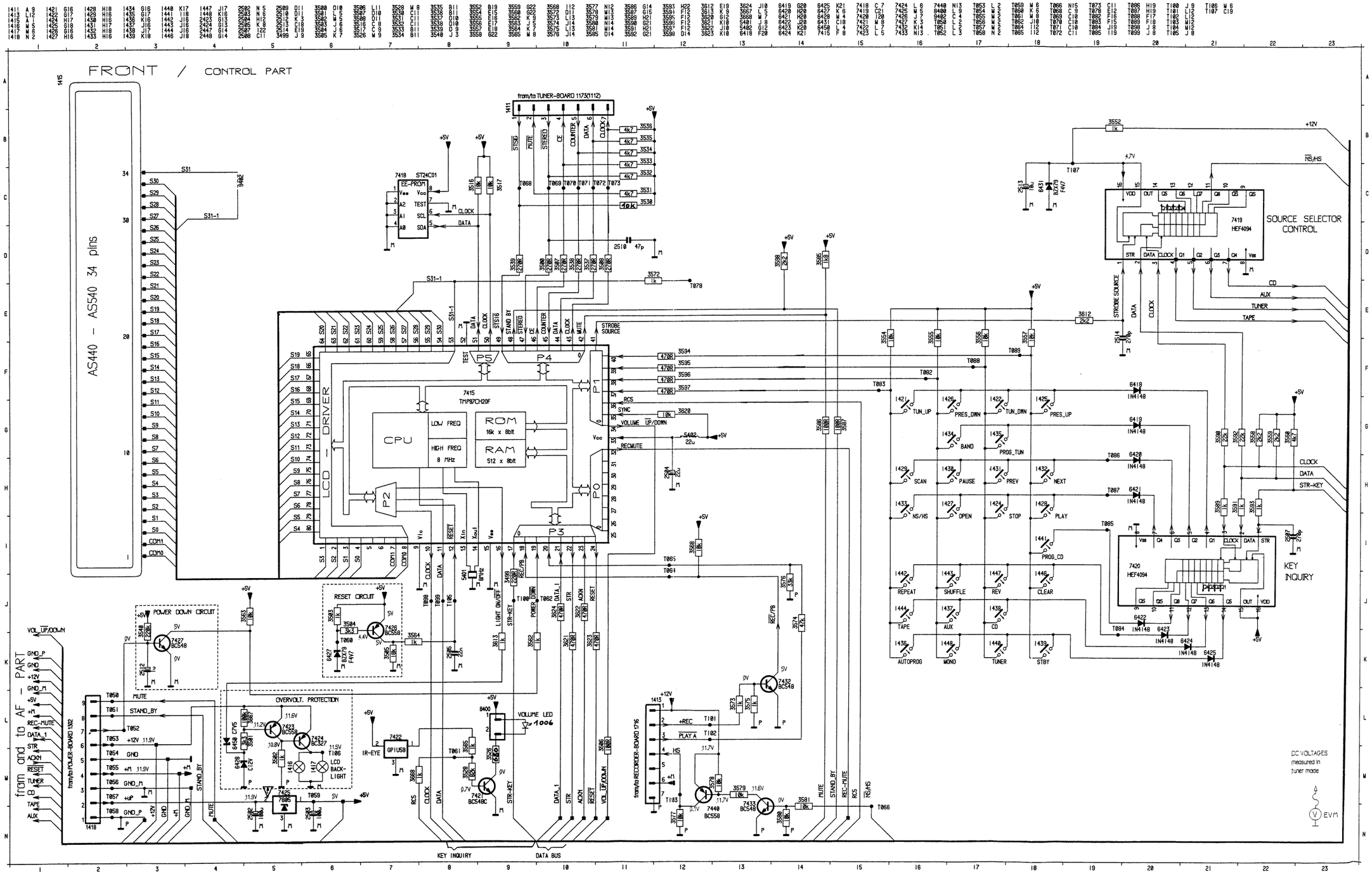
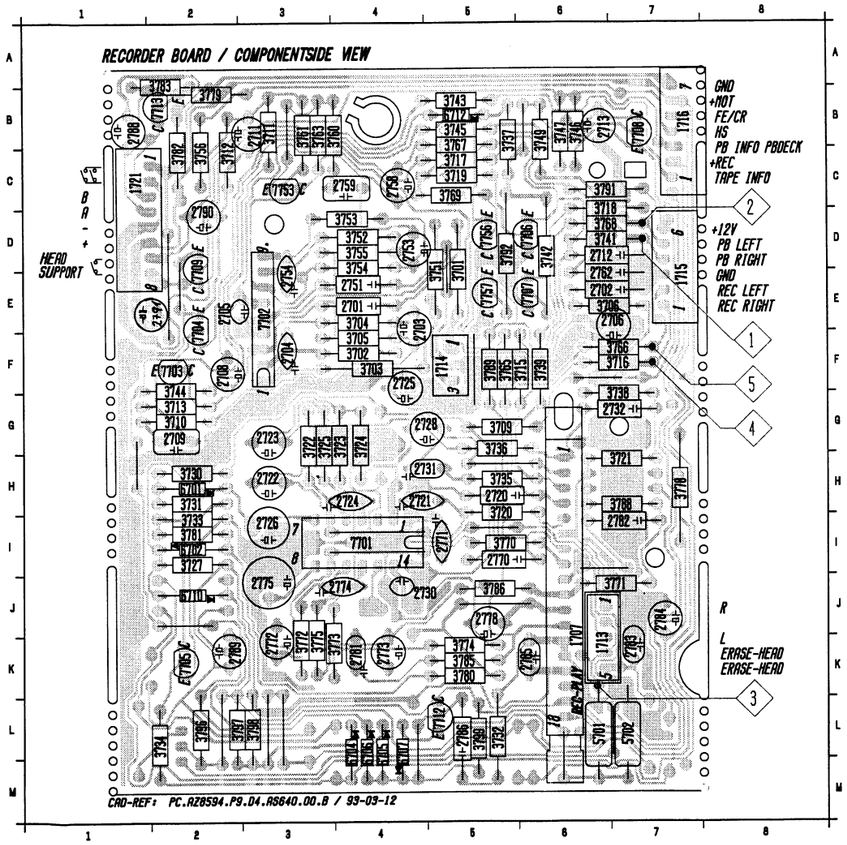
2407	D	2	3424	C	3	3572	A	11	7420	B	11				
2408	B	2	3425	D	4	3573	F	9	7421	D	5				
2409	C	2	3426	C	4	3574	F	9	7422	B	1				
2410	B	3	3427	F	2	3575	F	9	7423	D	9				
2411	C	3	3428	E	3	3576	F	11	7424	D	9				
2412	B	2	3431	F	2	3577	E	9	7425	E	5				
2413	C	4	3432	F	3	3578	F	9	7426	A	11				
2414	B	2	3433	F	1	3579	F	10	7427	D	5				
2415	C	3	3434	F	2	3580	E	10	7432	D	9				
2416	B	3	3435	E	2	3581	E	10	7433	E	10				
2417	C	4	3436	E	3	3585	B	4	7440	E	9				
2418	B	3	3437	D	2	3586	C	5	7445	C	2				
2419	F	2	3438	D	2	3587	F	5	7446	B	2				
2420	E	3	3439	D	12	3589	B	11	7447	I	9				
2421	E	2	3440	D	12	3590	D	4	7448	I	9				
2422	F	3	3441	C	13	3591	B	11	8400	D	7				
2423	B	2	3442	C	13	3592	D	4							
2424	B	4	3443	D	13	3593	B	11							
2425	F	2	3444	D	13	3594	B	5							
2426	F	3	3445	D	12	3595	B	5							
2427	E	2	3446	D	13	3596	B	5							
2428	E	3	3447	D	12	3597	B	5							
2429	E	13	3448	D	12	3598	A	2							
2430	E	13	3449	D	11	3601	E	2							
2431	D	12	3450	D	11	3602	F	3							
2432	E	13	3451	D	11	3603	F	2							
2433	D	12	3452	D	11	3604	F	3							
2434	D	13	3455	E	10	3605	C	1							
2435	D	12	3456	E	11	3606	C	1							
2436	D	12	3457	E	11	3607	C	2							
2437	D	12	3458	E	11	3608	C	2							
2438	D	12	3459	E	12	3609	D	2							
2439	D	11	3460	E	12	3610	D	10							
2440	D	11	3461	E	12	3612	B	5							
2441	D	11	3462	E	13	3613	C	7							
2442	D	11	3463	C	11	3615	A	2							
2443	E	10	3464	D	12	3616	E	7							
2444	E	11	3465	C	12	3617	G	7							
2445	D	11	3466	C	12	3618	F	6							
2446	D	10	3469	C	12	3620	B	6							
2447	C	4	3478	B	12	3621	E	1							
2448	C	4	3471	E	13	3622	D	1							
2449	C	13	3472	E	13	3623	E	2							
2450	C	12	3473	C	13	3624	E	1							
2451	C	11	3474	D	13	3649	H	9							
2452	C	12	3475	F	2	3650	I	9							
2453	D	13	3476	E	3	3651	H	10							
2454	B	13	3477	F	8	3652	I	9							
2455	C	11	3478	F	7	3653	H	8							
2456	C	12	3480	D	7	3654	I	8							
2460	D	3	3481	D	13	3655	I	9							
2461	D	3	3482	D	12	3660	I	9							
2462	D	4	3483	D	12	3661	I	9							


FRONT / CONTROL PART
AS440 - AS540 34 pins
from/to TUNER-BOARD 1173(1112)
7418 ST24C01
EE-PROM
CLOCK
DATA
7415
TMP87CH20F
CPU
LOW FREQ
HIGH FREQ
8 MHz
ROM
16k x 8bit
RAM
512 x 8bit
LCD - DRIVER
POWER DOWN CIRCUIT
RESET CIRCUIT
OVERVOLT. PROTECTION
LCD BACK-LIGHT
VOLUME LED
IR-EYE
7422
6PIU58
SOURCE SELECTOR CONTROL
7419
HEF4094
KEY INQUIRY
7420
HEF4021
7440
BC558
7427
BC548
7423
BC550
7424
BC327
7421
BC548C
7805
TUN_UP
TUN_DWN
PRES_UP
PRES_DWN
BAND
PROG_TUN
SCAN
PAUSE
PREV
NEXT
NS/HS
OPEN
STOP
PLAY
PROG_CD
REPEAT
SHUFFLE
REV
CLEAR
TAPE
AUX
CD
AUTOPROG
MONO
TUNER
STBY
CD
AUX
TUNER
TAPE
CLOCK
DATA
STR-KEY
KEY INQUIRY
DATA BUS
from and to AF - PART
from/to POWER-BOARD 1512
from/to RECORDER-BOARD 1716
DC VOLTAGES measured in tuner mode
EVM



1707	J6	3711	B3	3783	A2	2730	J4	3741	D6	7705	K2
1713	K6	3712	C2	3785	K5	2731	H5	3742	D6	7706	D6
1714	F5	3713	G2	3786	J5	2732	G7	3743	B5	7707	E6
1715	E7	3715	F6	3788	H7	2751	E4	3744	F2	7708	B7
1716	B7	3716	F7	3789	F5	2753	D4	3745	B5	7709	D2
1721	C1	3717	C5	3791	C6	2754	E3	3746	B6	7712	L5
2701	E4	3718	D6	3792	D5	2758	C4	3747	B6	7713	B2
2702	E6	3719	C5	3796	L2	2759	C4	3749	B6	7753	C3
2703	E4	3720	H5	3797	L2	2762	E6	3751	D5	7756	D5
2704	F3	3721	H7	3798	L3	2770	I5	3752	D4	7757	E5
2705	E2	3722	G3	3799	L5	2771	I5	3753	D4	9701	L7
2706	E7	3723	G4	5701	L6	2772	K3	3754	D4	9702	L6
2708	F2	3724	G4	5702	L7	2773	K4	3755	D4	9705	L4
2709	G2	3725	G3	6701	H2	2774	J4	3756	C2	9706	J2
2711	B3	3727	I2	6702	I2	2775	J3	3760	B4	9707	H1
2712	D6	3730	H2	6704	L4	2778	J5	3761	B3	9708	D5
2713	B6	3731	H2	6705	L4	2781	K4	3763	B3	9709	E2
2720	H5	3732	L5	6706	L4	2782	I7	3765	F5	9711	J5
2721	H4	3733	I2	6707	L4	2783	K7	3766	F7	9712	I6
2722	H3	3734	L2	6710	J2	2784	J7	3767	B5	9713	I5
2723	G3	3735	H5	6712	B5	2785	K6	3768	D6	9714	I4
2724	H4	3736	G5	7701	I4	2786	L5	3769	C5	9715	I4
2725	F4	3737	B5	7702	E3	2788	B1	3770	I5	9716	H5
2726	I3	3738	G7	7703	F2	2789	K2	3771	J7	9717	B3
2728	G5	3739	F6	7704	E2	2790	D2	3772	K3	9722	F5
2730	J4	3741	D6	7705	K2	3701	D5	3773	K3	9723	F6
2731	H5	3742	D6	7706	D6	3702	F4	3774	K5	9727	L3
2732	G7	3743	B5	7707	E6	3703	F4	3775	K3	9731	E2
2751	E4	3744	F2	7708	B7	3704	E4	3778	H7	9732	L2
2753	D4	3745	B5	7709	D2	3705	F4	3779	B2	9733	L3
2754	E3	3746	B6	7712	L5	3706	E6	3780	K5	9741	B6
2758	C4	3747	B6	7713	B2	3709	G5	3781	I2	2791	E1
2759	C4	3749	B6	7753	C3	3710	G2	3782	C2		

RECORDER ADJUSTMENT TABLE

Adjustment	Cassette/Source	Recorde mode	Measure on	Read on	Adjust with	Adjust to
Azimuth [1]	SBC 420 8kHz	PLAY A-Deck PLAY B-Deck	◇1 ◇2 or Phone socket	mV - meter	left-hand screw	maximum output left = right
Motor speed [2] Normal speed	SBC 420 3150Hz	PLAY A + B-Deck HS-Dubbing	◇1 ◇2 or Phone socket	Wow and Flutter meter or Counter	pot on motor	0±1%
High speed [4]				Counter	check only	5556-5783Hz

CHECK ONLY

Check	Cassette/Source	Recorder mode	Measure on	Read on	Check if
Wow and Flutter	SBC 420 3150Hz	PLAY A or B-Deck	◇1 ◇2	Wow and Flutter meter	≤ 0,3% weighted
		PLAY A and B-Deck	or Phone socket		≤ 0,35% weighted
Erase Oscillator					Cr ≥ 9,8Vrms Fe ≥ 20,8 Vrms
Voltage	any	REC A-deck	◇3 Erase head	mV - meter Counter	
Frequency					f = 60kHz ± 5kHz
Playback level [3]	SBC420 315Hz 0dB level	PLAY A-Deck[5]	◇1 ◇2	mV - meter	41 mV - 57 mV
		PLAY B-Deck[5]			41 mV - 57 mV
Fequency reponse Playback	SBC420	PLAY A or B-Deck[5]	◇1 ◇2	mV - meter	125 Hz - 10 kHz within 8dB
Overall	Level = 0,5mV ◇4 ◇5	REC A-Deck[5] PLAY A-Deck[5]	◇1 ◇2	mV - meter	125 Hz - 10 kHz within 8dB 125 Hz - 8 kHz dubbing
Distortion	SBC 420 Level = 10mV ◇4 ◇5	REC A-Deck[5] PLAY A-Deck[5]	◇1 ◇2	mV - meter	50 mV ± 10 mV, D ≤ 5%

SBC 420 Service code: 4822 397 30071

1) For Azimuth adjustment set need not to be dismantled. Remove ornamental part of cassette door and put screwdriver (torx5) through holes of cassette door.
2) Absolute difference between deck A and deck B have to be ≤2%.
3) Noise level in "PAUSE" should be 80 - 180µV (A-weighted).
4) Insert SBC420 in A-Deck and use High speed dubbing mode to check frequency.
5) Recorder has to be in Fe- Mode

RECORDER BOARD

RIGHT CHANNELS

LEFT CHANNELS

ERASE OSCILLATOR

DECK A

DECK B

ERASE HEAD

REC

PB

ALC

ALC LEVEL SWITCH

MUTE DECK A right

MUTE DECK B right

MUTE DECK A

MUTE DECK B left

MUTE DECK A left

HS = H

NS/MS switch

REC RIGHT

REC LEFT

GND

RIGHT OUT PB

LEFT OUT PB

+12V

TAPE MODE = H

HIGHSPEED POSSIBLE = L

HIGHSPEED = H

Chrome = H

TAPE INFO

+REC

PB INFO

HIGH SPEED

FE/CR*

+MOT

GND MOT

* only for AS640

TAPE DECKS

MOTOR CONTROL

HEAD SUPPORT INDICATION

PB-DECK B

TO FRONT BOARD

AF PART 1405

CONTROL PART 1413

DC VOLTAGES

V PB-mode

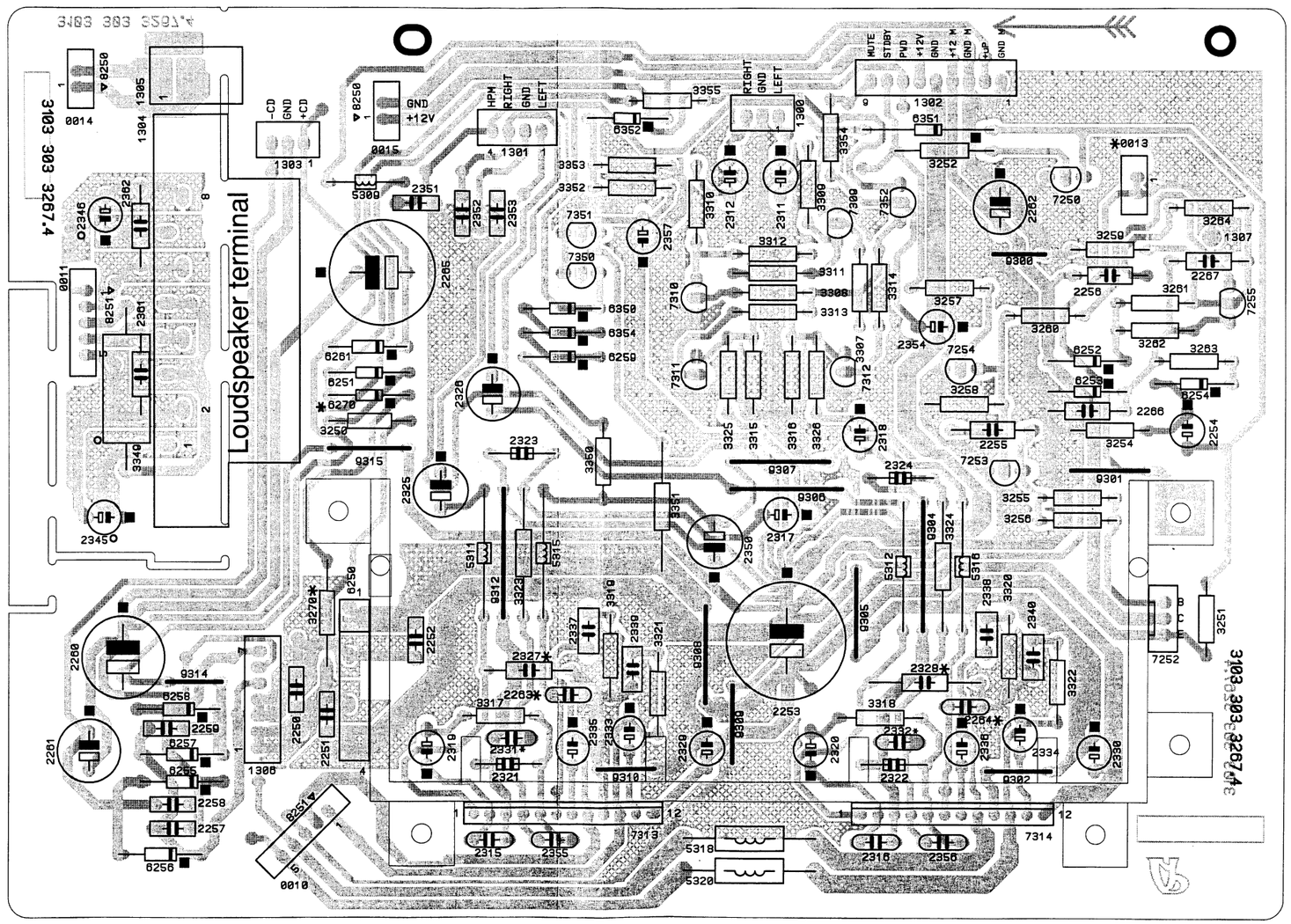
REC mode

* NOT USED COMPONENTS

o FOR SURROUND ONLY

E B C FOR ALL TRANSISTORS

POWER BOARD / Component side view



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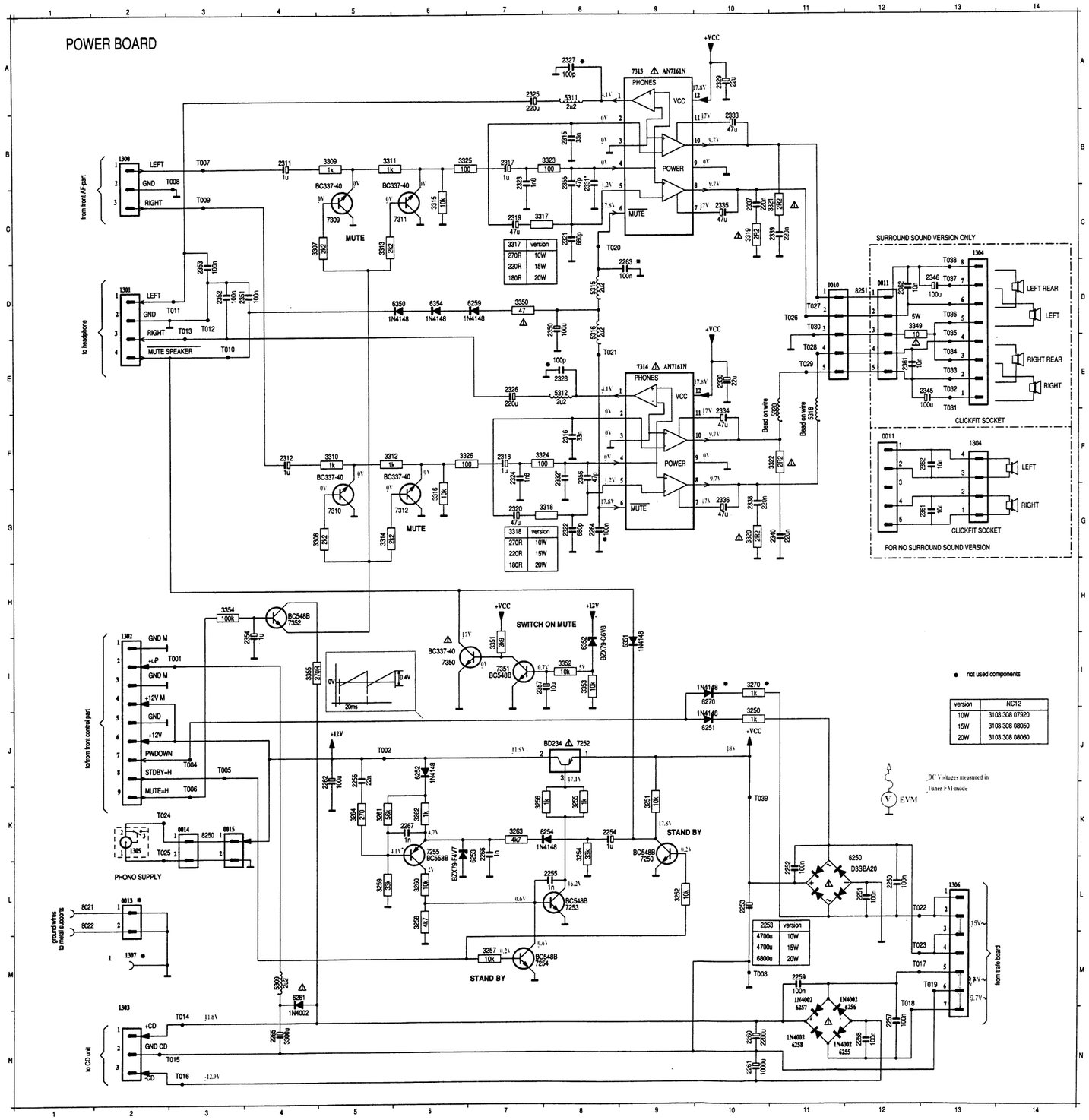
	9302 A 2	7309 D 3	6261 D 6	5320 A 3	3351 C 4	3318 A 3	3307 D 3	3255 C 1	2353 E 5	2335 A 4	2324 C 2	2311 E 3	2257 A 7	1304 D 7
9315 C 6	9301 C 1	7255 D 1	6259 D 5	5318 A 3	3350 C 4	3317 A 5	3270 B 6	3254 C 1	2352 E 5	2334 A 2	2323 C 5	2267 D 1	2256 D 1	1303 E 6
9314 B 7	9300 D 2	7254 D 2	6258 A 7	5316 B 2	3349 C 7	3316 D 3	3264 E 1	3252 E 2	2351 E 5	2333 A 4	2322 A 2	2266 C 1	2255 C 2	1302 E 2
9312 B 5	7352 E 2	7253 C 2	6257 A 7	5315 B 5	3328 D 3	3315 D 3	3263 D 1	3251 B 1	2350 C 4	2332* A 2	2321 A 5	2265 D 6	2254 C 1	1301 E 5
9310 A 4	7351 D 4	7252 B 1	6256 A 7	5312 B 2	3325 D 3	3314 D 3	3262 D 1	3250 C 6	2346 E 7	2331* A 5	2320 A 3	2264 A 2	2253 B 3	1300 E 3
9309 A 3	7350 D 4	7250 E 1	6255 A 7	5311 B 5	3324 B 2	3313 D 3	3261 D 1	2362 D 7	2345 C 7	2330 A 1	2319 A 5	2263 B 4	2252 B 5	0015 E 6
9308 B 4	7314 A 2	6354 D 5	6254 D 1	5309 E 6	3323 B 5	3312 D 3	3260 D 2	2361 D 7	2340 B 2	2329 A 4	2318 C 3	2262 E 2	2251 A 6	0014 E 7
9307 C 3	7313 A 5	6352 E 4	6253 C 1	3355 E 4	3322 B 1	3311 D 3	3259 D 1	2357 D 4	2339 B 4	2328 B 2	2317 C 3	2261 A 7	2250 B 6	0013 E 1
9306 C 3	7312 D 3	6351 E 2	6252 D 1	3354 E 3	3321 B 4	3310 E 4	3258 C 2	2356 A 2	2338 B 2	2327 B 5	2316 A 3	2260 B 7	1307 E 1	0011 D 7
9305 B 3	7311 D 4	6350 D 5	6251 D 6	3353 E 4	3320 B 2	3309 E 3	3257 D 2	2355 A 5	2337 B 4	2326 C 5	2315 A 5	2259 A 7	1306 B 6	0010 A 6

TRANSFORMER BOARD

POWER BOARD



version	NC12
10W	3103 308 07920
15W	3103 308 08050
20W	3103 308 08060

3317	version
270R	10W
220R	15W
180R	20W

3318	version
270R	10W
220R	15W
180R	20W

2253	version
4700u	10W
4700u	15W
6800u	20W

0010 D11
0011 D12
0013 L2
0014 K3
0015 K3
1300 B2
1301 D2
1302 I2
1303 M2
1304 C13
1305 K2
1306 L13
1307 M2
2250 L12
2251 L12
2252 L11
2253 L10
2254 K8
2255 L8
2256 J5
2257 N12
2258 N12
2259 M11
2260 N10
2261 N10
2262 J5
2263 D9
2264 G8
2265 N4
2266 K7
2267 K6
2311 B4
2312 F4
2315 B8
2316 F8
2317 B7
2318 F7
2319 C7
2320 G7
2321 C8
2322 G8
2323 B7
2324 F7
2325 A7
2326 E7
2327 A8
2328 E8
2329 A10
2330 E10
2331 B8
2332 F8
2333 B10
2334 F10
2335 C10
2336 G10
2337 C10
2338 G10
2339 C11
2340 G11
2345 E13
2346 D13
2350 D8
2351 D4
2352 D3
2353 D3
2354 H4
2355 B8
2356 F8
2357 I7
2361 E12
2362 D12
3250 J10
3251 K9
3252 L9
3254 K8
3255 K8
3256 K7
3257 M7
3258 L6
3259 L5
3260 L6
3261 K5
3262 K6
3263 K7
3264 K5
3270 I10
3307 C4
3308 G4
3309 B5
3310 F5
3311 B5
3312 F5
3313 C5
3314 G5
3315 C5
3316 G6
3317 C7
3318 G8
3319 C10
3320 G10
3321 C11
3322 F11
3323 B8
3324 F7
3325 B6
3326 F6
3348 D12
3350 D7
3351 I7
3352 I8
3353 I8
3354 H3
3355 I4
5309 M4
5311 A8
5312 E8
5315 D8
5316 D8
5318 E11
5320 E11
6250 L12
6251 J10
6252 J6
6253 K7
6254 K8
6255 N12
6256 N12
6257 N11
6258 N11
6259 D7
6261 M4
6270 I10
6350 D6
6351 I9
6352 I8
6354 D6
7250 K9
7252 J8
7253 L8
7254 M7
7255 K6
7309 C5
7310 G5
7311 C6
7312 G6
7313 A9
7314 E9
7350 I6
7351 I7
7352 H4
T001 I3
T002 J5
T003 M10
T004 J3
T005 J3
T006 K3
T007 B3
T008 B3
T009 C3
T010 E3
T011 D3
T012 D3
T013 D3
T014 N3
T015 N3
T016 N3
T017 M12
T018 M12
T019 M13
T020 C8
T021 E8
T022 L12
T023 M12
T024 K2
T025 K2
T026 D11
T027 D11
T028 E11
T029 E11
T030 D11
T031 E13
T032 E13
T033 E13
T034 E13
T035 D13
T036 D13
T037 D13
T038 C13
T039 K10

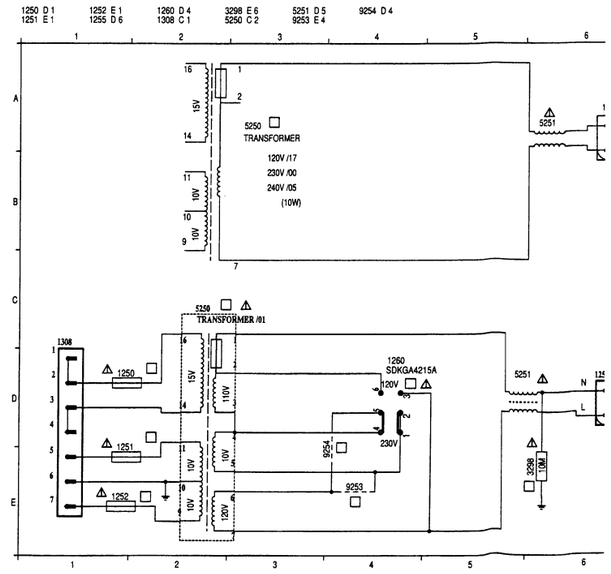
TRANSFORMER BOARD

□ COMPONENTS DEPENDING ON THE VERS

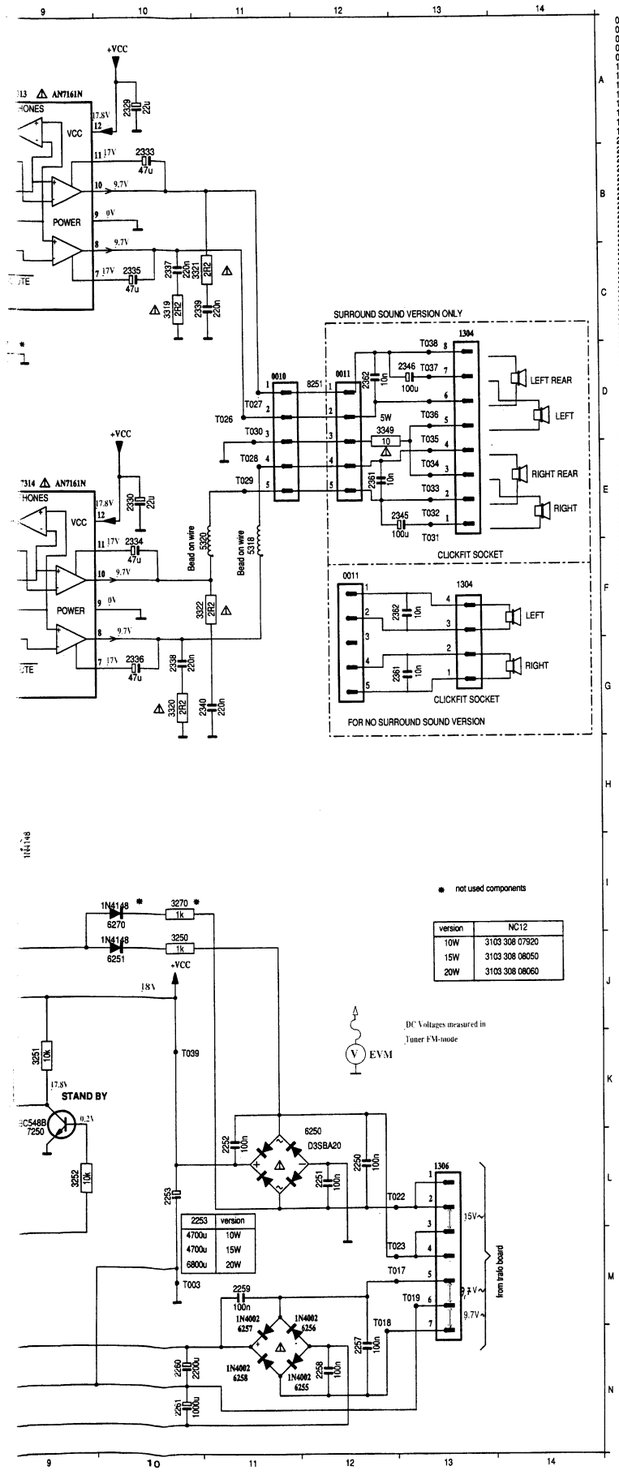
VERSION \ COMPONENTS	1260	9253	9254	5250	3298	VALUE OF FUSE 1250 (1254)	1251 (1253)	1252 (1255)
/00 (IEC 230V)				/00		5A	630mA	630mA
/05 [1] (240V)		X		/01		5A	630mA	630mA
/17 (UL 120V)				/17	X	6.3A	1,25A	1,25A
/01 /10 (120V,230V)	X		X	/01		5A	630mA	630mA
/05 [1] (240V)				/05		5A	630mA	630mA

1) for 15V and 20V versions /01 transformer
for 10V version /05 transformer

1250 D 1
1251 E 1
1252 E 1
1255 D 6
1260 D 4
1308 C 1
3298 E 6
5250 C 2
5251 D 5
9253 E 4
9254 D 4



TRANSFORMER BOARD

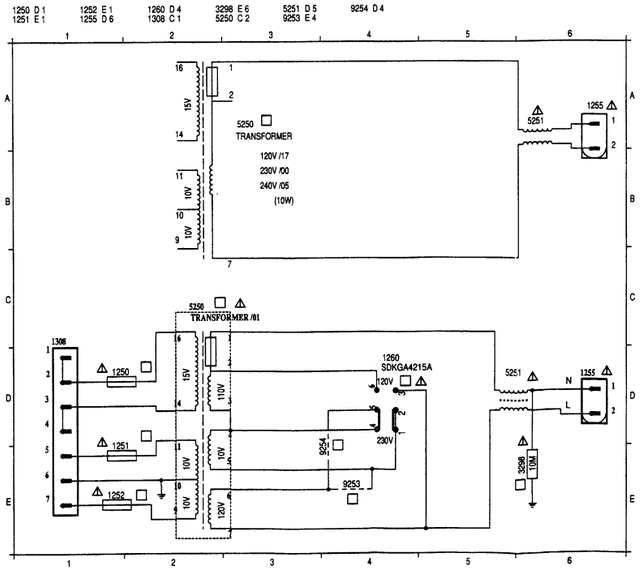


0010 D11
0011 D12
0013 L2
0014 K3
0015 K3
1300 B2
1301 D2
1302 I2
1303 M2
1304 C13
1305 K2
1306 L13
1307 M2
2250 L12
2251 L12
2252 L11
2253 L10
2254 K8
2255 L8
2256 J5
2257 M12
2258 M13
2259 M11
2260 M10
2261 M10
2262 J5
2263 D9
2264 G8
2265 N4
2266 K7
2267 K6
2311 B4
2312 F4
2315 B8
2316 F6
2317 B7
2318 F7
2319 C7
2320 G7
2321 C8
2322 G8
2323 B7
2324 F7
2325 A7
2326 E7
2327 A8
2328 E8
2329 A10
2330 E10
2331* B8
2332* F8
2333 B10
2334 F10
2335 C10
2336 G10
2337 C10
2338 G10
2339 C11
2340 G11
2345 E13
2346 D13
2350 D8
2351 D4
2352 D3
2353 D3
2354 H4
2355 B3
2356 F8
2357 I7
2361 E12
2362 D12
3250 J13
3251 K3
3252 L9
3254 K9
3255 K9
3256 K7
3257 M7
3258 L6
3259 L5
3260 L6
3261 K5
3262 K6
3263 K7
3264 K5
3270 I10
3307 C4
3308 G4
3309 B5
3310 F5
3311 B5
3312 F5
3313 C5
3314 G5
3315 C6
3316 G6
3317 C7
3318 G8
3319 C10
3320 G10
3321 C11
3322 F11
3323 B8
3324 F7
3325 B6
3326 F6
3348 D12
3350 D7
3351 I7
3352 I8
3353 I8
3354 H3
3355 I4
5309 M4
5311 A8
5312 E8
5315 D8
5316 D8
5318 E11
5320 E11
6250 L12
6251 J10
6252 J6
6253 K7
6254 K8
6255 N12
6256 N12
6257 N11
6258 N11
6259 D7
6261 M4
6270 I10
6350 D6
6351 I9
6352 I8
6354 D6
7250 K9
7252 J8
7253 L8
7254 M7
7255 K6
7309 C5
7310 G5
7311 C6
7312 G6
7313 A9
7314 E9
7350 I6
7351 I7
7352 H4
T001 I3
T002 J5
T003 M10
T004 J3
T005 J3
T006 K3
T007 B3
T008 B3
T009 C3
T010 E3
T011 D3
T012 D3
T013 D3
T014 N3
T015 N3
T016 N3
T017 M12
T018 M12
T019 M13
T020 C8
T021 E6
T022 L12
T023 M12
T024 K2
T025 K2
T026 D11
T027 D11
T028 E11
T029 E11
T030 D11
T031 E13
T032 E13
T033 E13
T034 E13
T035 D13
T036 D13
T037 D13
T038 C13
T039 K10

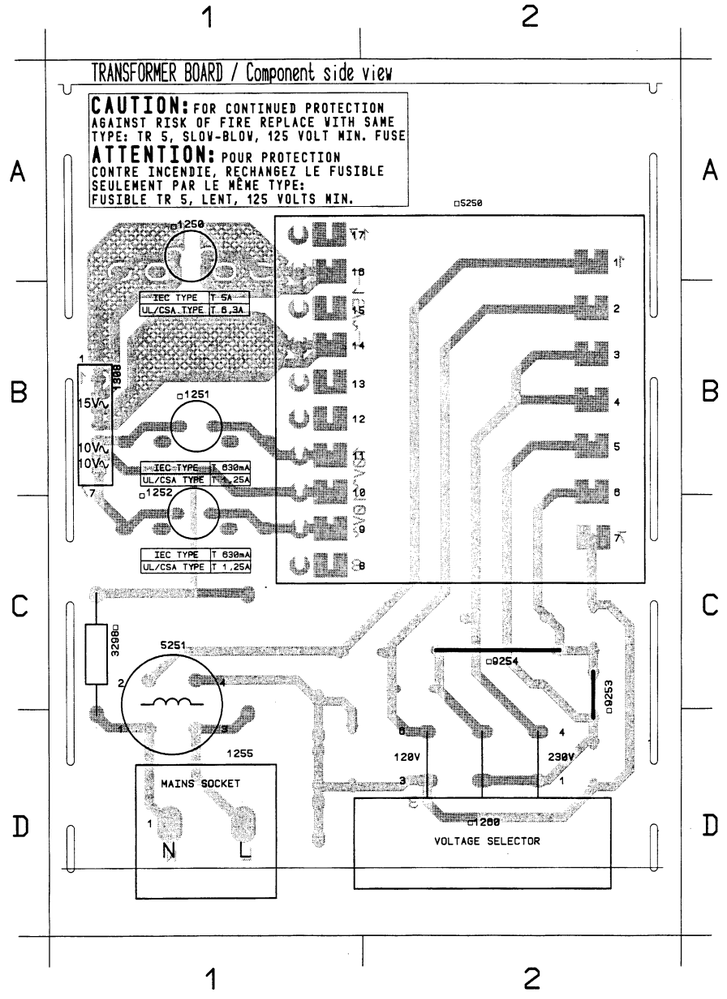
☐ COMPONENTS DEPENDING ON THE VERSION

VERSION \ COMPONENTS ☐	1260	9253	9254	5250	3298	VALUE OF FUSE 1250 (1254)	1251 (1253)	1252 (1256)
/00 (IEC 230V)				/00		5A	630mA	630mA
/05 1) (240V)		X		/01		5A	630mA	630mA
/17 (UL 120V)				/17	X	6,3A	1,25A	1,25A
/01 /10 (120V,230V)	X		X	/01		5A	630mA	630mA
/05 1) (240V)				/05		5A	630mA	630mA

1) For 15V and 20V versions /01 transformer
for 10V version /05 transformer



1250 D1
1251 E1
1252 E1
1255 D6
1260 D4
1308 C1
3298 E6
5250 C2
5251 D5
9253 E4
9254 D4



1250 B 1
1251 B 1
1252 C 1
1253 B 1
1254 B 1
1255 D 1
1256 C 1
1257 D 1
1258 D 1
1260 D 2
1308 B 1
3298 C 1
3299 C 1
5250 B 2
5251 C 1
9250 C 2
9251 D 2
9252 C 2
9253 C 2
9254 C 2
9255 C 2
9256 C 2
9257 D 1

TUNER UNIT ECO4 (MIDI)

TO/FROM CONTROL BOARD

TO/FROM CONTROL BOARD

AF left
GND
AF right
+V
CL
DATA
COUNTER DATA
CE
STEREO
MUTE
STSD

STABILIZING CIRCUIT +5V

SIGNAL PATH
FM
AM
AF

VCC FM mode steven
VCC MW mode
VCC LW mode

voltages measured while set is tuned to a strong transmitter

o for 2-band version only
x for LW version only
* for USA version only

VERSION PROGRAMMING DIODES

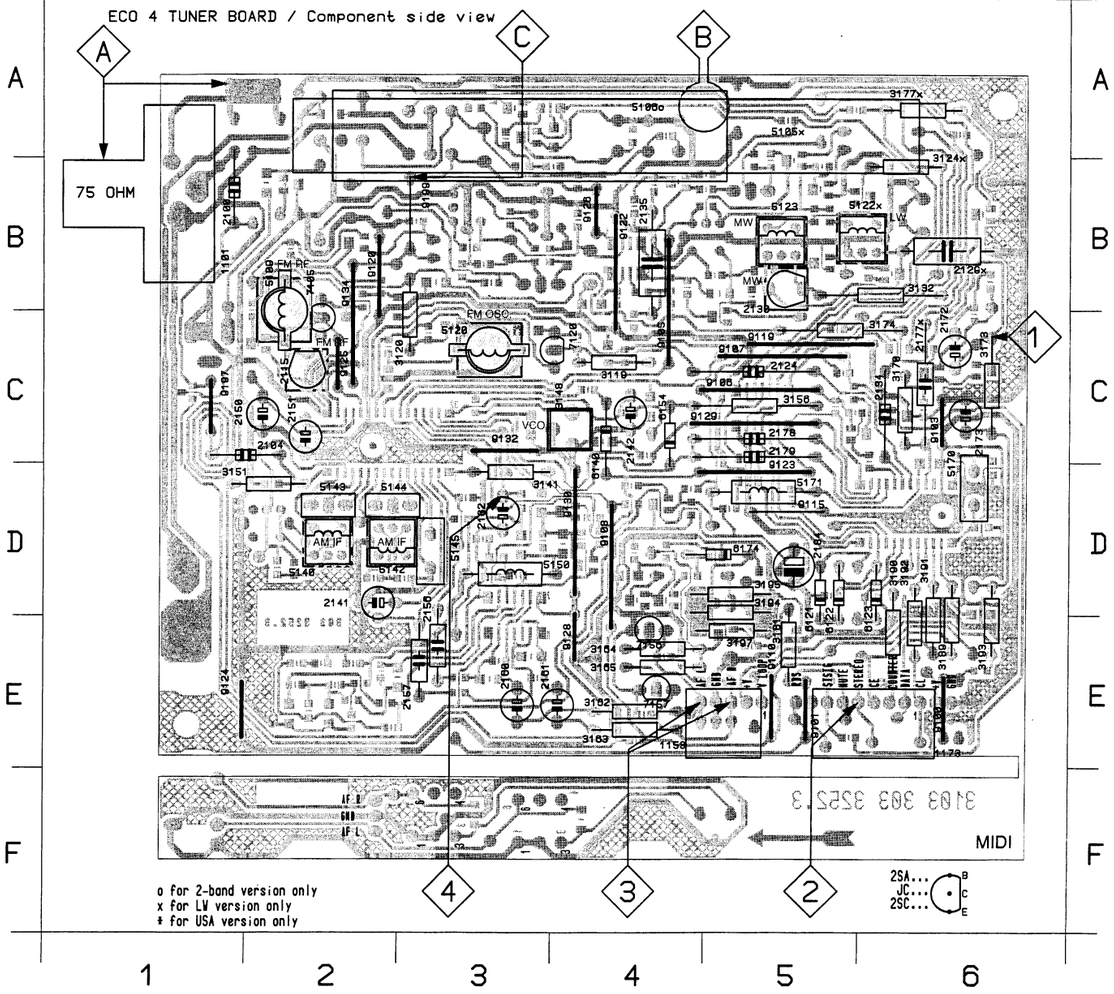
	6121	6122	6123
FM, MW, LW EUROPE			
FM, MW, LW EAST EUROPE	X	X	X
FM, MW USA /17	X		X
FM, MW OVERSEA /01		X	
FM, MW, LW, SW		X	
FM, MW, SW		X	X
X=DIODE MOUNTED			

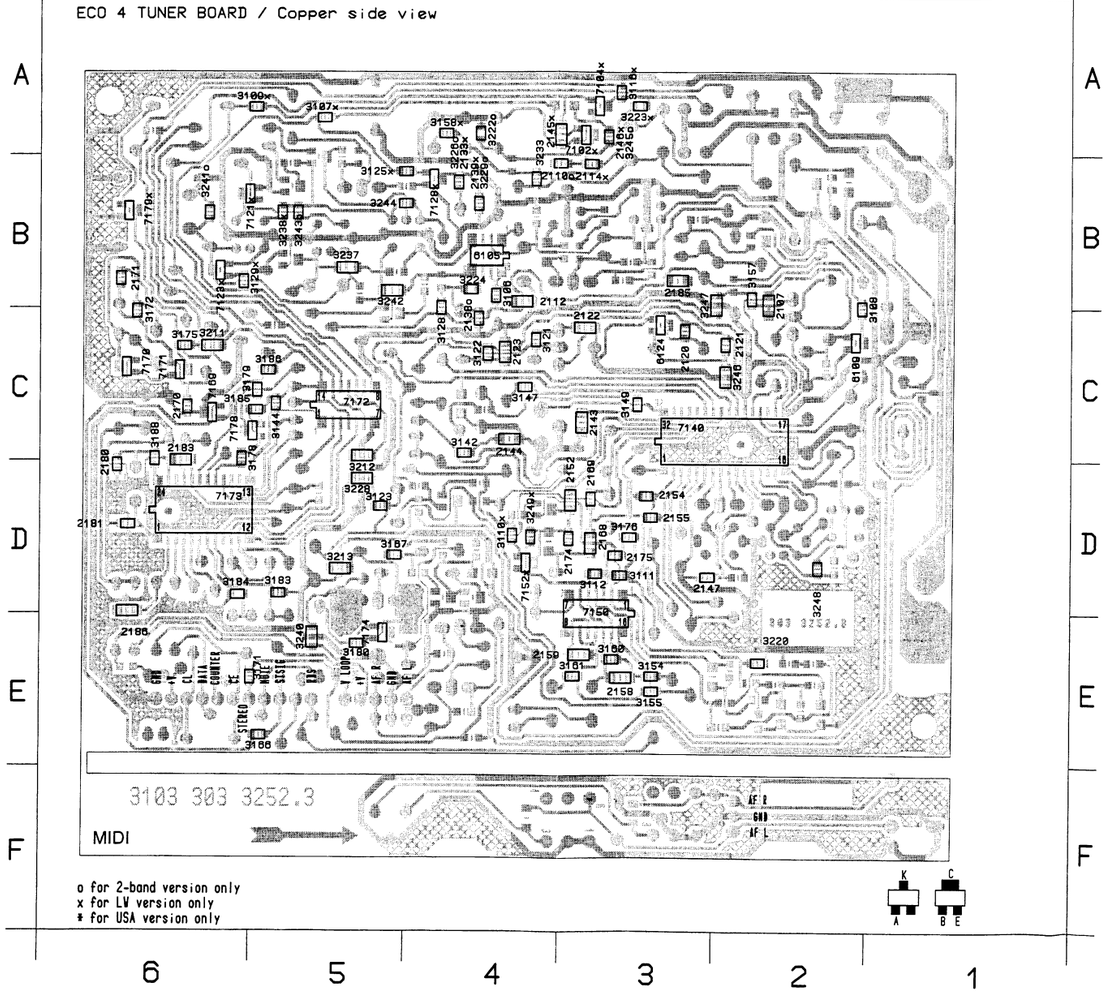
HEF 4069 UBT
MM 74HC04M1

MUTE ON
MUTE OFF
0V=no communications
MUTE=LOW
MUTE LEFT
MUTE RIGHT
MUTE
LevMUTE
LevSIG
Tuning info
Level sens. (Adjustore 1, ref)
SEARCH SENSITIVITY
Stereo-indic
Tuning-indic
F-COUNT=HIGH
IF
FM/AM SWITCH
AM=HIGH
MONO=LOW
STEREO=LOW
TUNED=LOW
LOOP FILTER STEREO DECODER
19/76fH FILTER
AM OSCILLATOR
AM-WAVEBAND SWITCHING LOGIC
LOOP FILTER
PADDING
HNM1N62H
HANWOH
SYNTHESIZER
REFERENCE DIVIDER
PHASE DET.
SHIFT REGISTER LATCH
UNIVERSAL COUNTER
VCO KILLER
FM OSC AMP
Found strong signal during SEARCH
Weak signal
Strong signal
stereo mono stereo
7.2MHz
7.24MHz
Tuned
Tuned up
Tuned down

1101 B 1	2134 C 6	2161 E 4	3120 B 3	3184 E 4	3191 D 6	5120 C 3	5170 D 6	7120 C 4	9108 D 4	9126 B 4
1153 E 5	2135 B 4	2162 D 3	3124x B 6	3185 E 4	3192 D 6	5122x B 5	5171 D 5	7156 E 4	9110 E 5	9128 D 4
1173 E 6	2141 D 2	2172 C 6	3132 B 5	3186 C 6	3193 E 6	5123 B 5	6121 D 5	7157 E 4	9115 D 5	9129 C 4
2100 A 1	2142 C 4	2173 C 6	3141 D 3	3173 C 6	3194 D 4	5140 D 2	6122 D 5	9100 E 6	9119 C 5	9130 D 4
2104 C 1	2150 C 2	2177x C 6	3148 C 3	3174 C 5	3195 D 4	5142 D 3	6123 D 6	9101 E 5	9120 C 2	9132 C 3
2115 C 2	2151 C 2	2178 C 4	3151 D 1	3177x A 6	3197 E 4	5143 D 2	6140 D 4	9103 C 6	9122 B 4	9134 B 2
2124 C 4	2156 D 3	2179 C 4	3156 C 4	3181 D 5	5105x A 4	5144 D 2	6154 C 4	9105 C 4	9123 D 4	9197 C 1
2129x B 6	2157 E 3	2184 D 5	3162 E 4	3189 D 6	5105o A 4	5145 D 3	6174 D 4	9106 C 4	9124 E 1	9199 B 3
2130 B 5	2160 E 3	3119 C 4	3163 E 4	3190 D 6	5109 C 2	5150 D 3	7105 C 2	9107 C 5	9125 C 2	

7171 C 6	6109 C 2	3238x B 5	3211 C 6	3171 E 5	3142 C 4	3108 B 2	2159 D 3	2139x B 4	T035 B 6	T015 A 6	T001 B 1
7172 C 5	6124 C 3	3240 E 5	3212 C 5	3172 C 6	3144 C 5	3109x A 5	2170 C 6	2143 C 3	T038 D 6	T020 E 4	T002 B 1
7173 D 6	7102x A 3	3241o B 6	3213 D 5	3175 C 6	3147 C 4	3110x D 4	2171 B 6	2144 C 4	2107 B 2	T021 E 4	T005 E 1
7174 E 5	7104x A 3	3242 B 5	3220 E 2	3176 D 3	3149 C 3	3111 D 3	2174 D 3	2145x A 3	2110o B 3	T022 E 5	T007 D 2
7178 C 5	7121x B 6	3243o B 5	3222o A 4	3178 C 6	3154 E 3	3112 D 3	2175 D 3	2146x A 3	2112 B 4	T023 D 5	T008 D 2
7179x B 6	7123x B 6	3244 B 4	3223x A 3	3179 C 5	3155 E 3	3116x A 3	2180 D 6	2147 D 3	2114x B 3	T027 E 6	T009 B 2
	7128x B 4	3245x A 3	3224 B 4	3180 E 5	3157 B 2	3121 C 4	2181 D 6	2152 D 3	2120 C 3	T028 E 6	T010 D 3
	7140 C 2	3246 C 2	3226o B 4	3183 D 5	3158x A 4	3122 C 4	2183 C 6	2154 D 3	2121 C 2	T029 E 6	T011 C 3
	7150 D 3	3247 B 2	3228 D 5	3184 D 6	3160 E 3	3123 D 5	2185 B 3	2155 D 3	2122 C 3	T030 E 6	T012 D 2
	7152x D 4	3248 D 2	3229o B 4	3185 C 5	3161 E 3	3125x B 4	2186 D 6	2158 E 3	2123 C 4	T031 E 6	T013 E 2
	7159 C 6	3249x D 4	3233 B 4	3186 C 5	3166 E 5	3128 B 4	2190 E 3	2159 E 3	2133x B 4	T032 E 5	T014 D 3
	7170 C 6	6105 B 4	3237 B 5	3188 C 6	3167 D 5	3129x B 6	3107x A 5	2168 D 3	2138o C 4	T033 E 5	T015 C 6





TUNER Adjustment table (ECO 4 FM/MW- and FM/MW/LW - versions with AM-ferrite antenna)

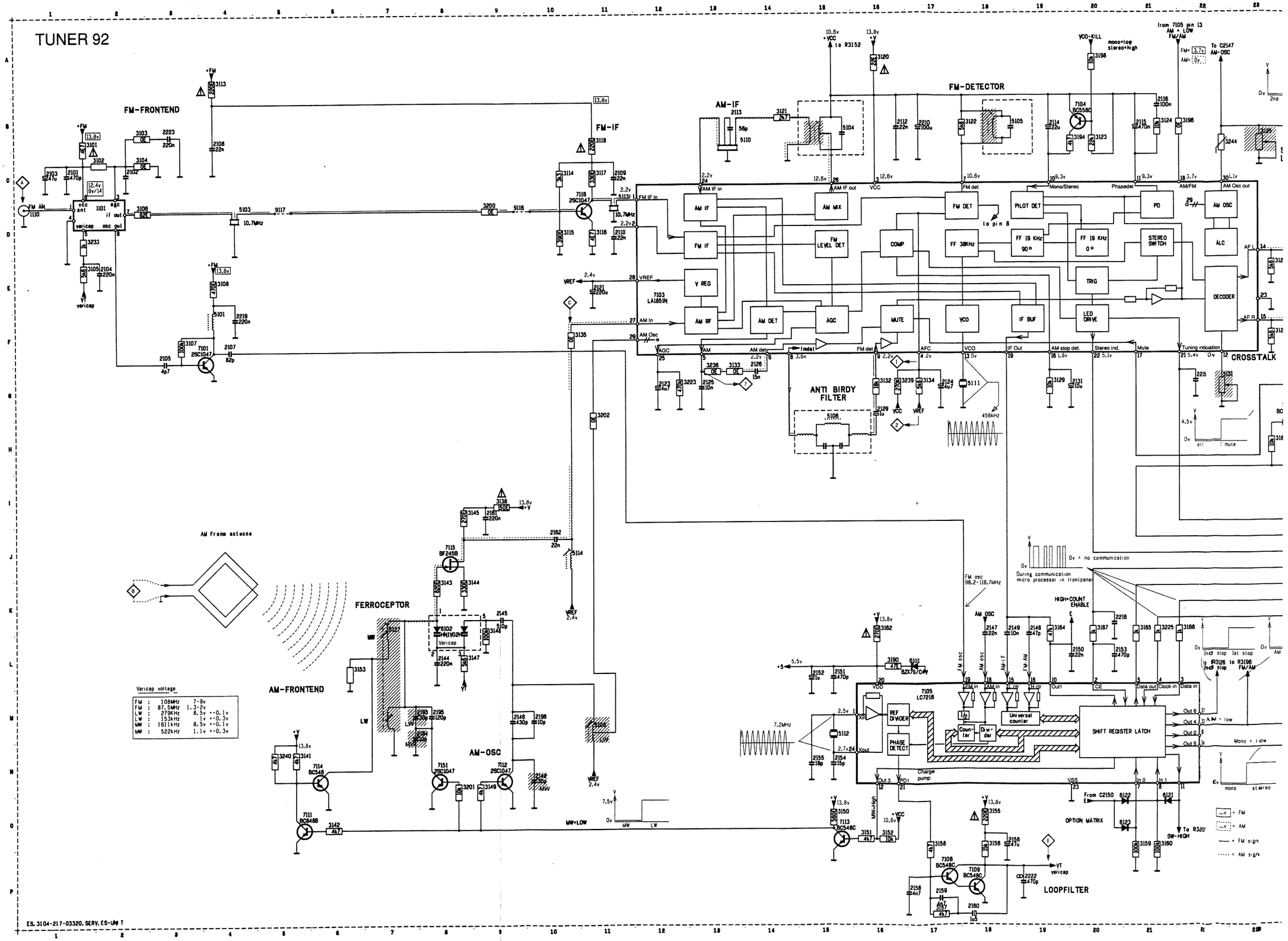
Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT * 1)						
FM /00/01/05/10/17			108 MHz	5120	1	8V ± 0.2V
87.5 - 108MHz			87.5MHz	check		4.1V ± 0.5V
FM /14 East Europe			108 MHz	5120		8V ± 0.2V
65.81 - 108MHz			65.81 MHz	check		0.8V ± 0.4V
MW /01/17 2-band version, 10kHz grid			1710kHz	5123		9V±0.1V (7.5±0.7V) 1)
530 - 1710kHz			530kHz	check		1V±0.4V (1.1±0.5V) 1)
LW /00/05/10/14			279kHz	5122		8V±0.2V (7.5±1.5V) 1)
153 - 279kHz			153kHz	check		1V±0.4V (1.1±0.5V) 1)
MW /00/05/10/14			1611kHz	5123		8V±0.1V (7.5±0.5V) 1)
522 - 1611kHz			522kHz	check		1V±0.4V (1.1±0.5V) 1)
FM - RF						
FM /00/01/05/10/17	108MHz	A	108MHz	2115	3	MAX ↕
	87.5MHz		87.5MHz	5109		
FM /14 East Europe	108MHz	mod=1kHz Δf=22.5kHz	108MHz	2115		
	65.81MHz		65.81MHz	5109		
VCO						
FM	98 MHz, 1mV continuous wave	A	98MHz	3148	2	152kHz ± 1kHz
AM - IF						
MW	540kHz Δf = 10kHz as low as possible	100nF 50E C	540kHz	5142 5140	4	symmetrical and max height
AM - RF						
LW	198kHz	B'	198kHz	5122	4	MAX
MW /00/05/10/14 3-band version	1494kHz		1494kHz	2130		MAX ↕
	549kHz		549kHz	5123		
MW /01/17 2-band version	1500kHz	mod=1kHz 30% AM	1500kHz	2130		
	550kHz		550kHz	5123		

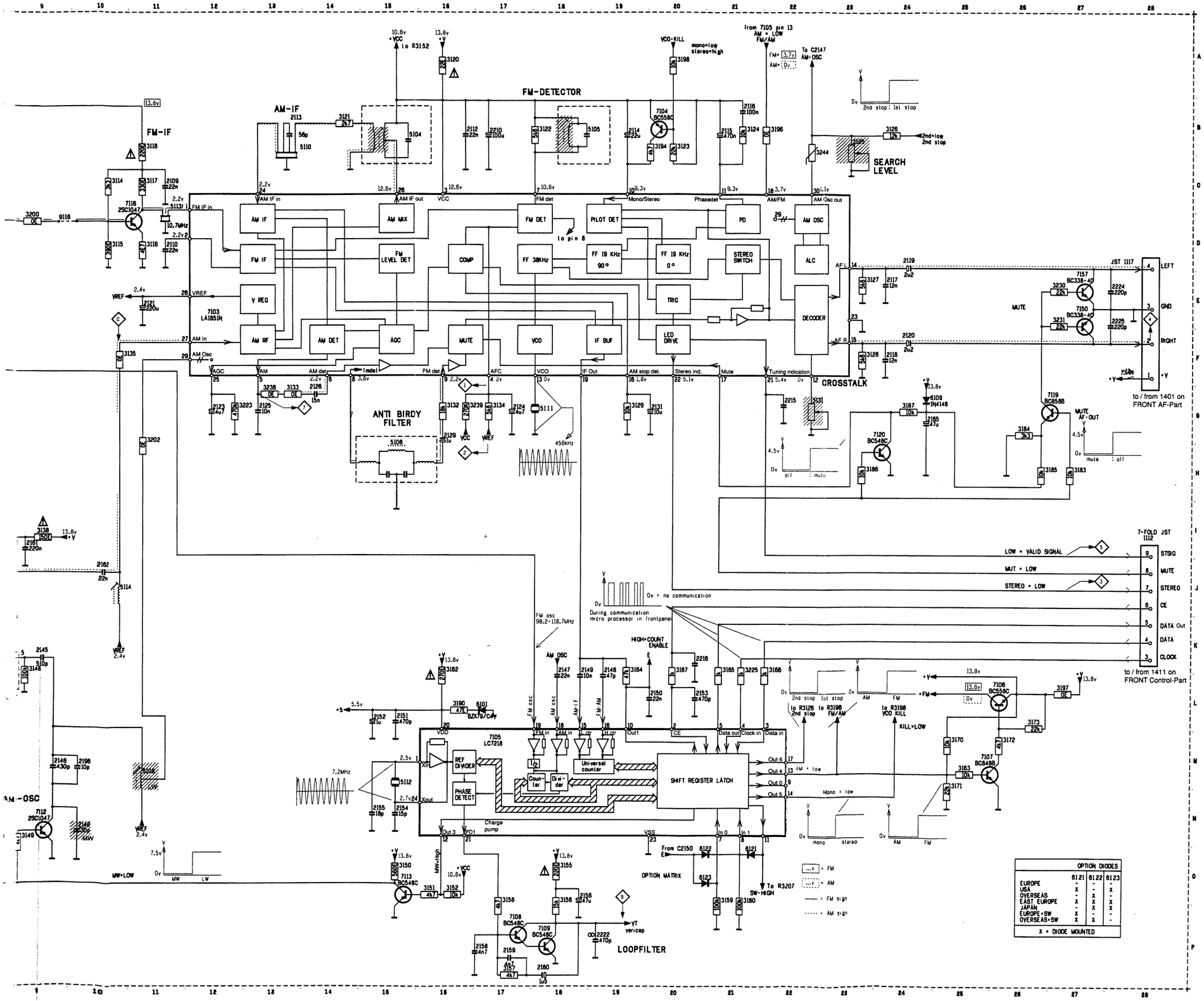
* Use Service Test Program. By selecting the TUNER TEST, test frequencies will be stored as preset frequ. automatically.

1) Adjustment of AM-RF stage influences the varicap voltage. Therefore check if varicap voltage fulfils value stated within brackets after AM-RF adjustment.

↕ repeat

TUNER 92


FM-FRONTEND
FM-IF
AM-IF
FM-DETECTOR
AM-FRONTEND
AM-OSC
FERROCEPTOR
AM Frame antenne
ANTI BIRDY FILTER
LOOPFILTER
OPTION MATRIX
7103 LA1851N
7105 LC7218
AM IF
FM IF
V REQ
AM RF
AM DET
AGC
MUTE
VCO
IF BUF
LED DRIVE
FM DET
PILOT DET
PD
AM OSC
ALC
FF 19 KHz 90°
FF 19 KHz 0°
FF 38KHz
STEREO SWITCH
TRIG
COMP
DECODER
FM LEVEL DET
AM MIX
CROSSTALK
REF DIVIDER
PHASE DETECT
Universal counter
SHIFT REGISTER LATCH
Charge pump
FM osc 98,2-118,7MHz
HIGH=COUNT ENABLE
During communication micro processor in frontpanel
Varicap voltage
FM : 108MHz 7-9v
FM : 87,5MHz 1,3-2v
LW : 279KHz 8,5v +-0,1v
LW : 153kHz 1v +-0,3v
MW : 1611kHz 8,5v +-0,1v
MW : 522kHz 1,1v +-0,3v
ES. 3104-217-03320. SERV. ES-UNIT



	1101 D2	5104 B15
	2101 C1	5105 B18
	2102 C2	5106 H15
	2103 C1	5111 D18
	2104 E2	5111 G18
	2105 F3	5112 M15
A	2107 F4	5127 K7
	2108 B4	6101 L17
	2109 C11	6102 K8
	2110 D11	6109 G24
	2112 B16	6121 O21
	2113 B13	6122 O21
	2114 B19	6123 O21
	2115 B21	7101 F4
	2116 B21	7103 E12
	2117 E24	7104 B20
B	2118 F24	7105 M17
	2119 D24	7106 L26
	2120 F24	7107 M25
	2121 E11	7108 P17
	2123 G12	7109 P18
	2124 G17	7111 O5
	2125 G13	7112 M9
	2126 G14	7113 O15
C	2129 G16	7114 N6
	2131 G20	7115 J8
	2141 K7	7116 C11
	2142 N10	7119 G27
	2144 L8	7120 G24
	2145 K9	7150 E27
	2146 H9	7151 M8
	2147 K18	7157 E27
	2148 K19	9116 D9
D	2149 K18	9117 O5
	2150 L20	
	2151 L15	
	2152 L15	
	2153 L20	
	2154 N15	
	2155 N15	
	2156 O18	
E	2158 P17	
	2159 P17	
	2160 P18	
	2161 I9	
	2162 J10	
	2165 G24	
	2193 M7	
	2194 M7	
F	2195 M8	
	2196 M10	
	2197 M10	
	2210 B17	
	2215 G22	
	2216 K20	
	2219 F4	
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	2223 B3	
	2224 E28	
	2225 E28	
	3101 B1	
	3102 C2	
	3103 B2	
	3104 C2	
H	3105 E1	
	3106 D2	
	3107 F3	
	3108 E4	
	3113 A4	
	3114 C10	
	3115 D10	
	3116 D11	
	3117 C11	
I	3118 B11	
	3120 A16	
	3121 B14	
	3122 B18	
	3123 B20	
	3124 B21	
	3126 B24	
	3127 E23	
	3128 F23	
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	3132 G16	
	3133 G13	
	3134 G17	
	3135 F10	
	3138 I9	
	3141 N5	
	3142 O6	
K	3143 K6	
	3144 K8	
	3145 I8	
	3147 L6	
	3148 K9	
	3149 N8	
	3150 O15	
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	3152 O16	
	3153 L6	
	3155 O18	
	3156 O18	
	3157 P17	
	3158 O17	
	3159 O21	
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	3162 K16	
	3163 M25	
	3164 K19	
	3165 K21	
	3166 K22	
	3167 K20	
	3170 M25	
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	3172 M26	
	3173 L26	
	3183 H27	
	3184 G26	
	3185 H26	
	3186 N23	
	3187 O24	
	3190 L16	
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	3196 B22	
	3197 L27	
	3198 R20	
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	3201 N8	
	3202 O11	
	3223 G12	
	3225 K21	
	3230 E27	
	3231 E27	
	3233 O1	
	3236 G13	
	3239 G16	
P	3240 N5	
	3244 B22	

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2108 B3	2148 B2	2159 C1	2222 B3	3106 B3	3123 E2	3135 C3	3152 B3	3170 A1	3194 E2	3230 D1	7111 F3				
2109 D3	2149 B2	2161 E5	2223 A2	3107 A3	3124 E3	3141 F4	3153 F4	3171 A1	3196 B2	3231 D1	7119 E1				
2110 C3	2150 C2	2195 E3	2224 F2	3114 E3	3126 B2	3142 F4	3156 C1	3172 A1	3197 C1	3233 B4	TUNER A1				
2112 C3	2151 B1	2196 D5	2225 F2	3115 D3	3127 C2	3143 E5	3157 C1	3173 A1	3198 B2	3236 E3					
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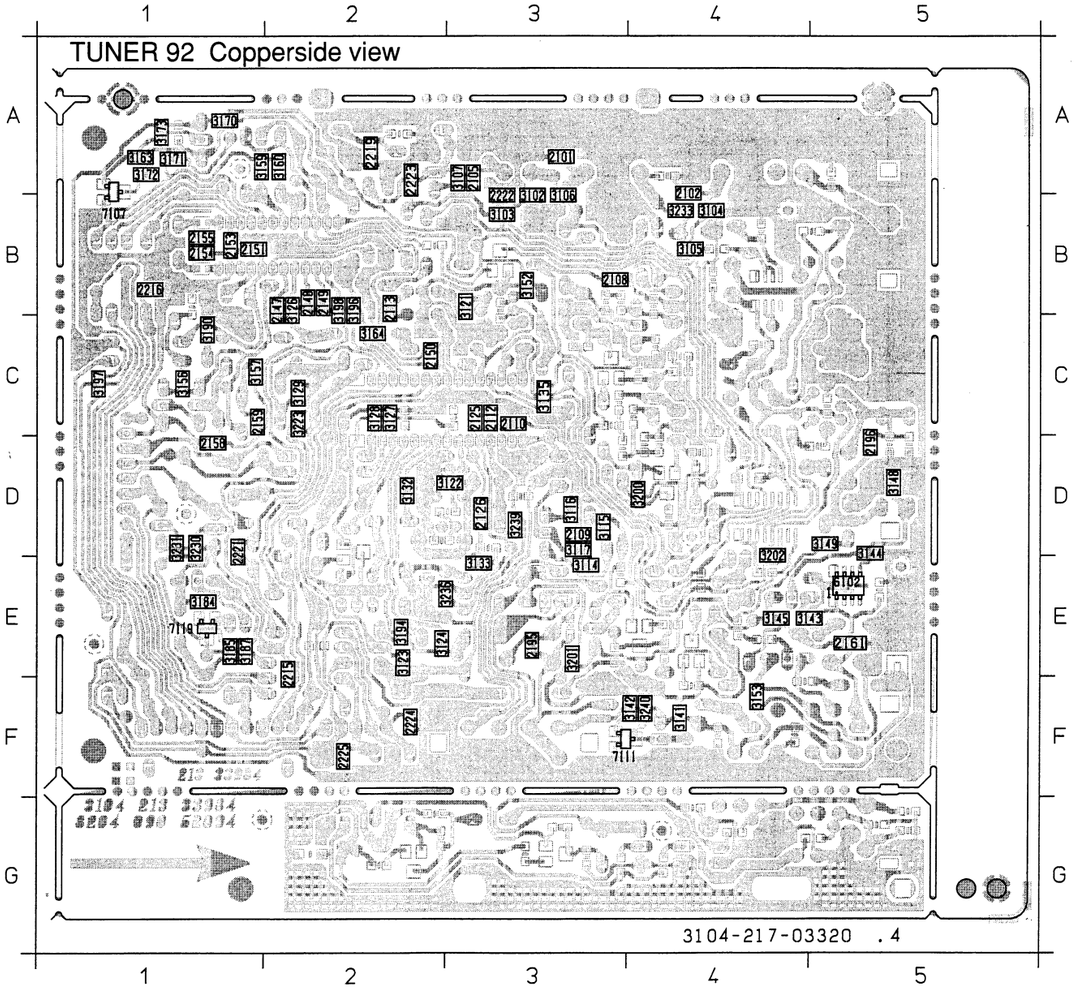

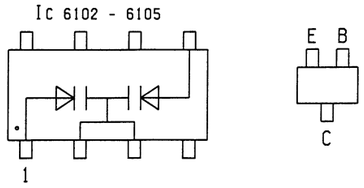

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2104 B2	2129 D4	2210 B3	3155 C5	5104 B3	6121 A4	7114 F2	9113 D3	9130 B4	9147 F5						
2107 B4	2131 C4	3101 B3	3158 C5	5105 D4	6122 A4	7115 E2	9114 F2	9132 C4	9149 E5						
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2117 D5	2146 C1	3120 F4	3167 B5	5111 D4	7104 E4	7151 E3	9119 E3	9138 B4							
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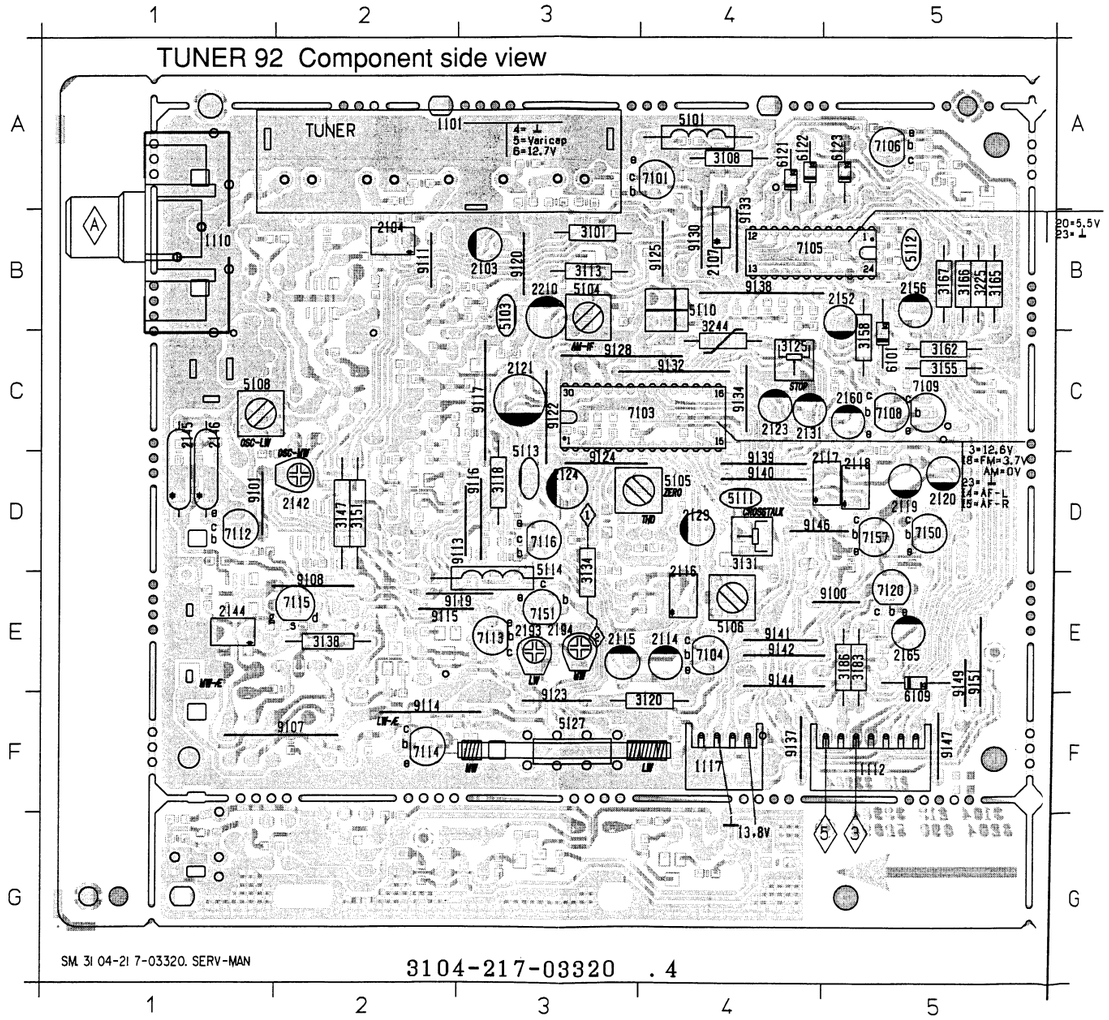
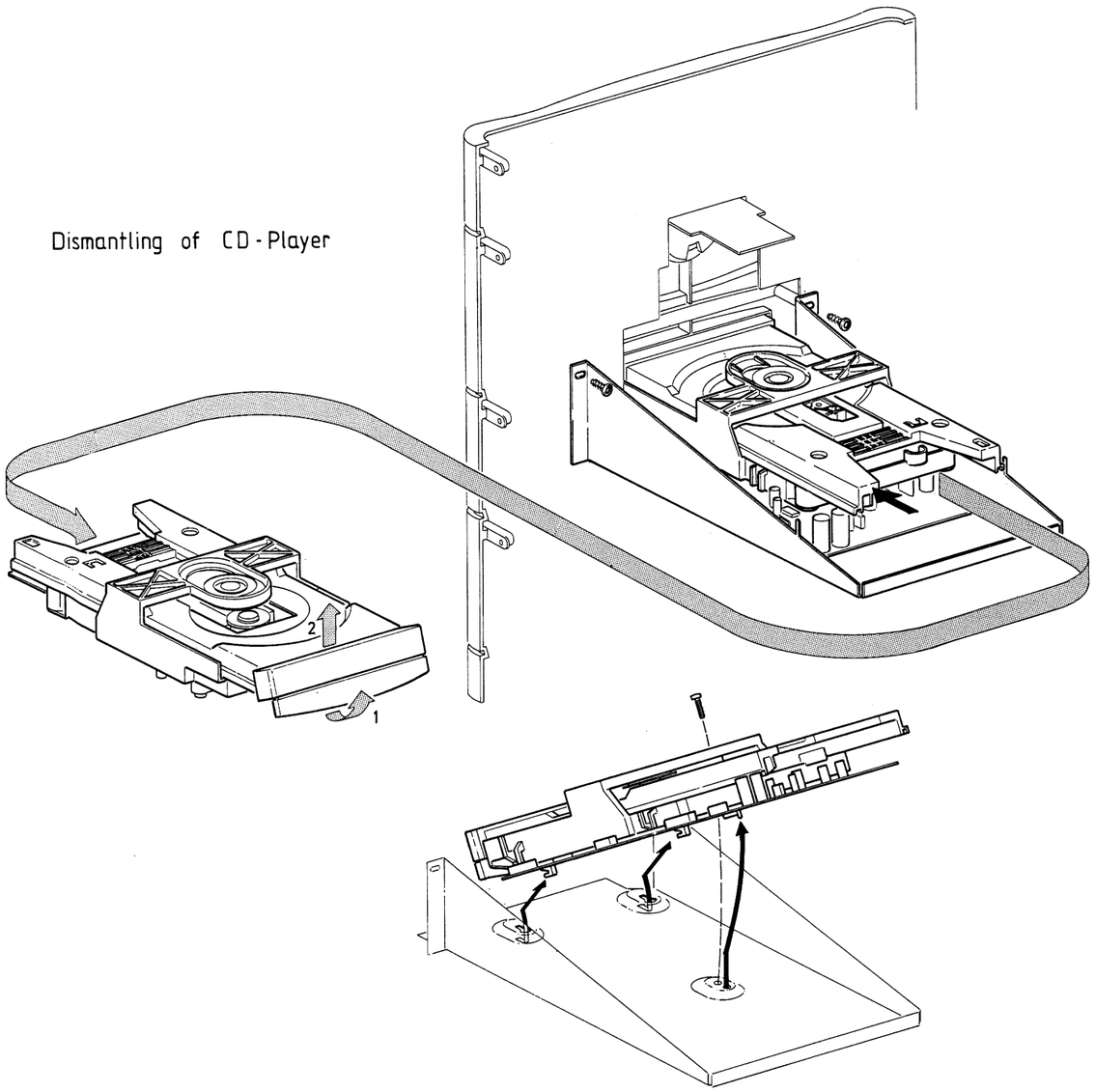


TUNER 92 Adjustment table (FM, MW - and FM, MW, LW - versions with AM ferrite antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz			108 MHz	check		7....9V
			87.5MHz	check		1.3....2V
AM 2-band version, 10kHz grid 530 - 1710kHz			1710kHz	5108		8.5V ± 0.1V
			530kHz	check	◇6	1V ± 0.3V
LW 153 - 279kHz			279kHz	5108		8.5V ± 0.1V
			153kHz	check		1V ± 0.1V
MW 522 - 1611kHz			1611kHz	2142		8.5V ± 0.1V
			522kHz	check		1.1V ± 0.3V
FM IF						
FM	98 MHz, 1mV mod = 1kHz Δf = 75kHz	◇A	98MHz	5105	◇1 ◇2	0V ± 20mV
STEREO CROSSTALK						
FM	98 MHz, 1mV 90% Left +9% pilot	◇A	98MHz	check	◇3	low < 1V
				3131	◇4	Right channel minimum
SEARCH SENSITIVITY						
FM	98 MHz, 15µV mod = 1kHz Δf = 75kHz	◇A	98MHz	3125	◇5	Switches just from High to Low
AM - IF						
MW	1494kHz Δf = 10kHz as low as possible	100nF 50E ◇C	1494kHz	5104	◇7	symmetrical and max height
AM RF						
AM 2-band version, 10kHz grid m=30%, 1kHz	560kHz	◇B	560kHz	5107	◇7	MAX. ↕
	1600kHz		1600kHz	2141		
LW m=30%, 1kHZ	155kHz		155kHz	5127 LW		
	270kHz		270kHz	2193		
MW m=30%, 1kHz	558kHz		558kHz	5127 MW		
	1494kHz		1494kHz	2194		

↕ repeat

Dismantling of CD-Player



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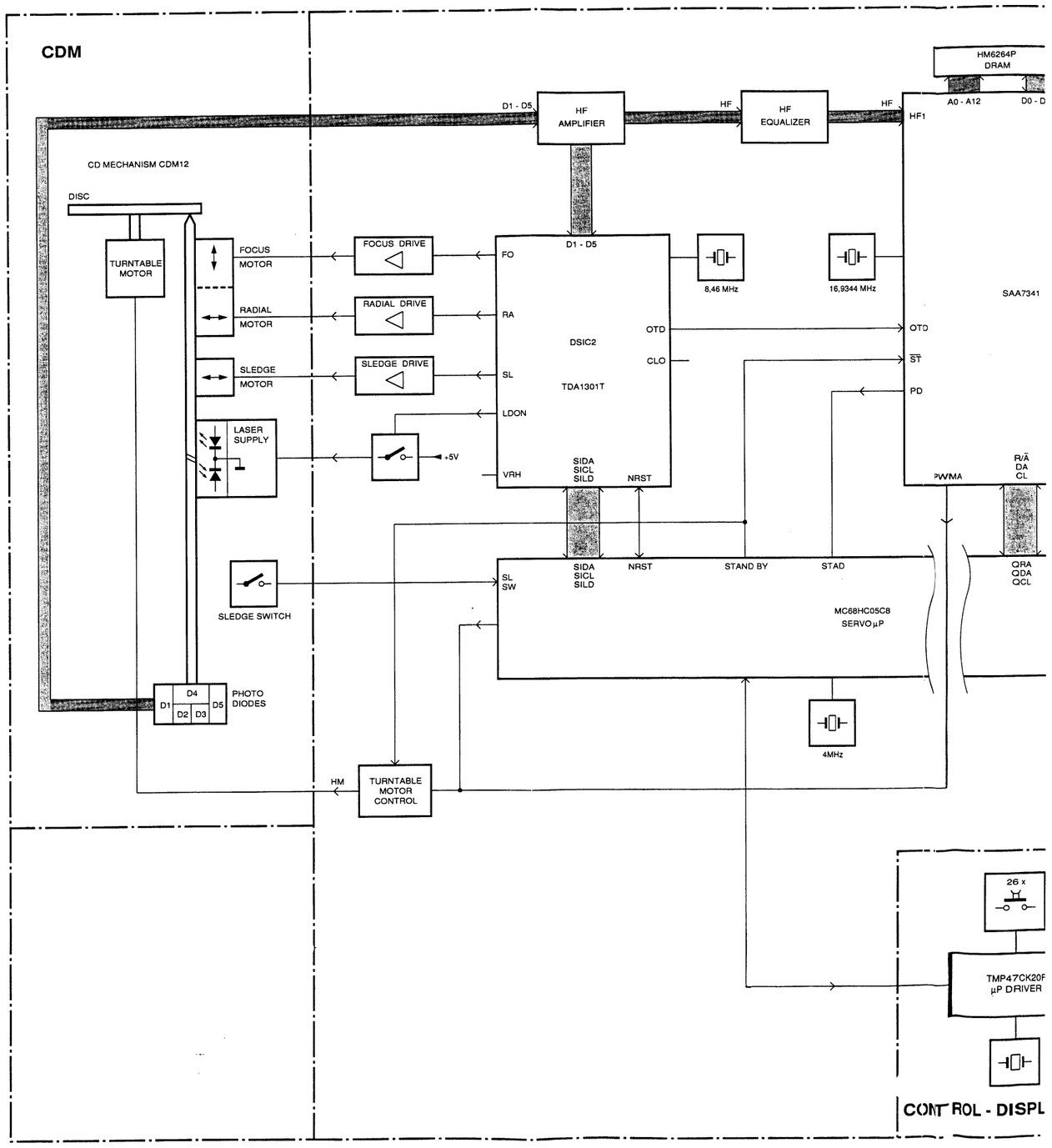

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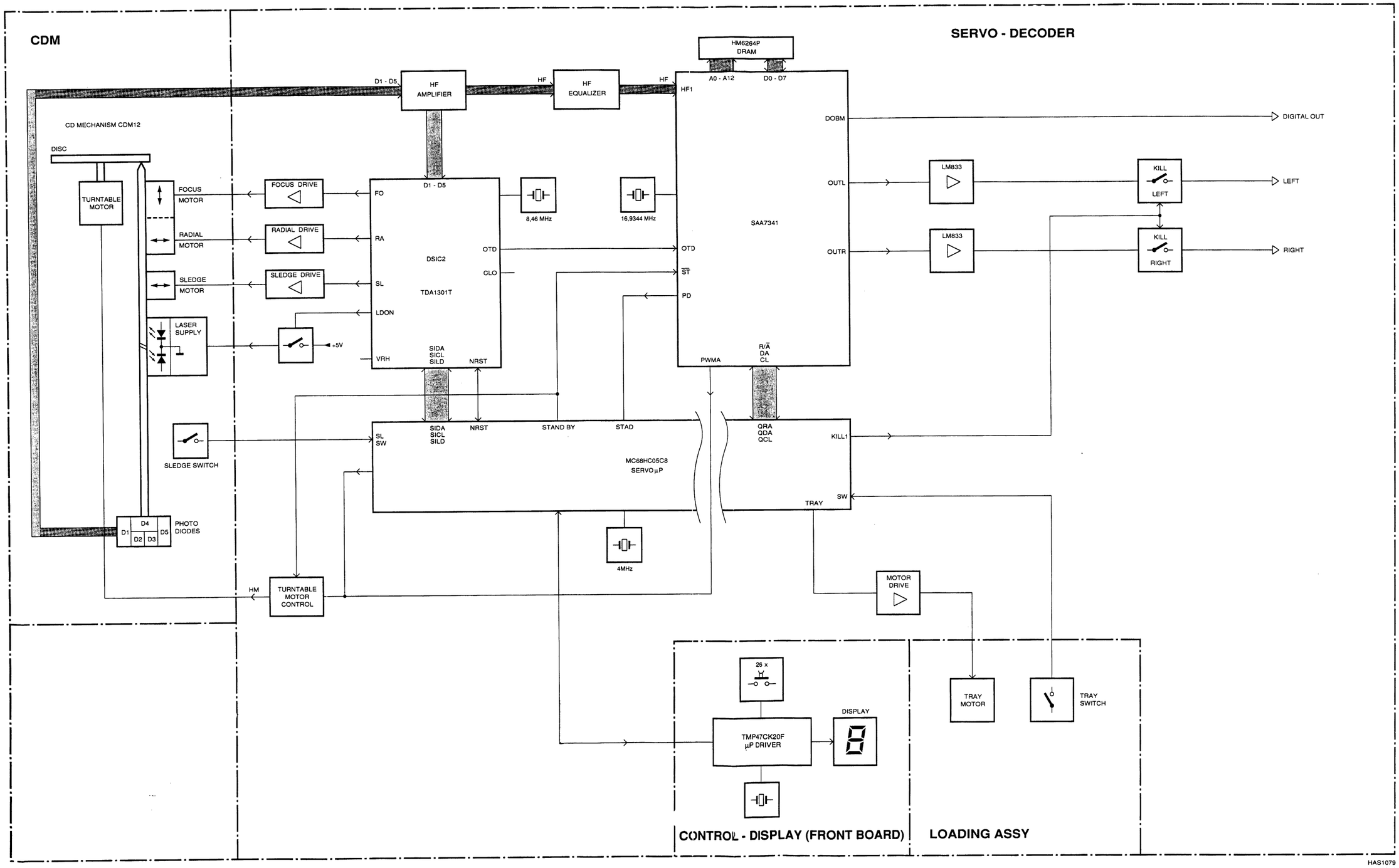
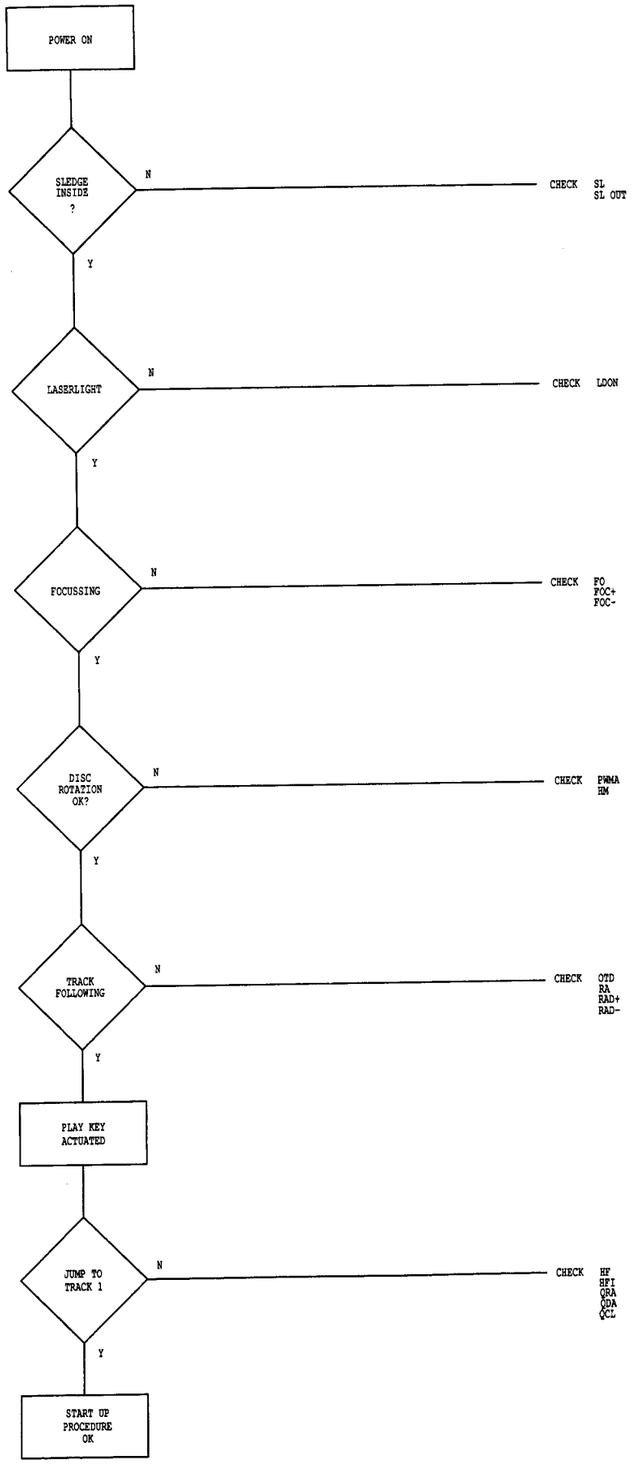
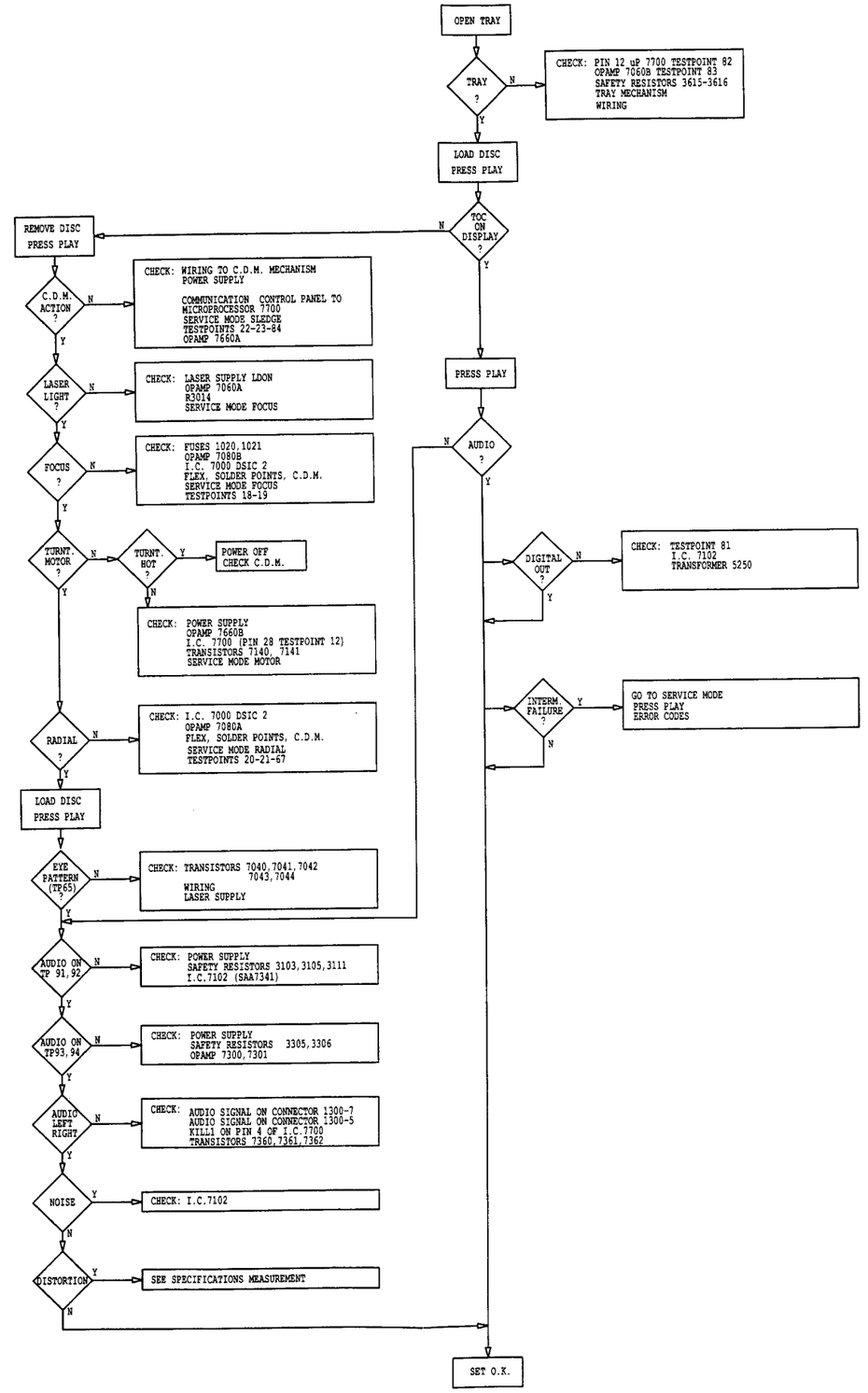


HAS1079
9216

START-UP PROCEDURE



FAULTFINDING TREE



ABBREVIATIONS

A0-A12	: Address outputs to external RAM
AM*	: Additional mute
CFB	: Data slicer feedback output to capacitor
CL	: Microprocessor interface clock input
CLO	: Clock output
D0-D7	: Data inputs/outputs to external RAM
D1-D4	: Central diode signal input
DA	: Microprocessor interface data input/output line
DE1L	: Pin 1 for external de-emphasis capacitor and resistor
DE1R	: Pin 1 for external de-emphasis capacitor and resistor
DE2L	: Pin 2 for external de-emphasis capacitor and resistor
DE2R	: Pin 2 for external de-emphasis capacitor and resistor
DEEM	: Output for external de-emphasis switches
DOBM	: Digital audio output
FO	: Focus actuator output
HFD	: High frequency detector
HFI*	: Inverting data slicer input
HFI	: Non-inverting data slicer input
HM	: Motor control signal
IREF	: Current reference output
KO*	: Kill out
KTC	: Kill time capacitor connection
LDON	: Laser drive on
MACC	: Motor accelerate signal
MBRA	: Motor brake signal
MHAL	: Hall effect detector for motor
NRST	: Reset input
OC	: VCO control
OTD	: Off track detector
OUTL	: Left channel output
OUTR	: Right channel output
PD	: Phase detector
PWMA	: Pulse width modulated motor control acceleration
PWMB	: Pulse width modulated motor brake signal
R/A	: Request/acknowledge
SD1-5	: Photodiode signals
SICL	: Serial interface clock
SIDA	: Serial interface data
SILD	: Serial interface load
SL	: Sledge output
ST*	: Standby mode
TS1-TS2	: Test input
VddA	: Power supply analog part
VddD	: Power supply digital part
VRH	: Reference input for A/D converter
VRL	: Reference input for A/D converter
VssA	: Ground analog part
VssD	: Ground digital part
WE	: Write enable
XIN	: Crystal oscillator input
XOUT	: Output to clock crystal
XTLI	: Oscillator input
XTLO	: Oscillator output
XTLR	: Oscillator reference

* log. 0-active !

CD COMPONENT AND CHIP LAYOUT

1002	D10	2008	F10	2050	G10	2101	E3	2122	G4	2502	C2	3010	F9	3052	I9	3075	I6	3140	E12	3310	D5	3552	C7	3711	C8	4106	F2	7080	H8	9007	B6	9027	C10	9049	D8
1010	F5	2009	E10	2051	G10	2102	E3	2123	F4	2503	B2	3011	E10	3053	H9	3080	E11	3141	D11	3311	D5	3553	C5	3713	C8	4107	F3	7101	I3	9008	B6	9028	C11	9050	C5
1011	H5	2010	F12	2052	G9	2103	I4	2125	E4	2504	C2	3012	E12	3054	H9	3081	H7	3142	D9	3312	C4	3610	F7	3714	C7	4108	F4	7102	G3	9009	B6	9029	B11	9051	E2
1020	F6	2011	D10	2060	C12	2104	I3	2140	C10	2550	C6	3013	D12	3055	G9	3082	G7	3143	C10	3313	C5	3611	D7	3715	C8	4109	I4	7140	D9	9010	F3	9031	D11	9052	E2
1021	H5	2012	C12	2061	B11	2105	E3	2141	D9	2610	F7	3014	F7	3056	G10	3085	I6	3144	E8	3314	C4	3612	F7	3716	C7	4200	I5	7141	D9	9011	F4	9032	E11	9053	D5
1052	F9	2015	F7	2062	C12	2106	F3	2253	E2	2611	F6	3015	D10	3057	G10	3086	E9	3146	E6	3315	C5	3613	G7	3717	C8	4302	C4	7300	D3	9012	E5	9033	E12	9054	D11
1070	B12	2016	E12	2063	C12	2107	E4	2300	D4	2612	B8	3016	I5	3058	H9	3087	H7	3147	D9	3320	D4	3614	E7	3718	C7	4600	F7	7301	D5	9013	E6	9034	E12	9055	D3
1071	B8	2017	E12	2064	D12	2108	F3	2301	D4	2702	B6	3017	F10	3060	D11	3100	E4	3148	D9	3321	D4	3615	F6	3719	C8	4700	C6	7360	C3	9014	D6	9035	E11	9056	D4
1250	D2	2018	E12	2065	C12	2109	E4	2302	D3	2703	B7	3040	H8	3061	D12	3101	F3	3255	F2	3322	D4	3616	E6	3720	C9	4701	C9	7361	C5	9015	D6	9036	G10	9057	E4
1300	B4	2019	B12	2066	C10	2110	F3	2303	D3	2704	C9	3041	I11	3062	D12	3102	E4	3256	E3	3323	C4	3617	B8	3721	C9	5250	E2	7362	C3	9016	D6	9037	G10		
1500	B3	2040	H9	2070	D10	2111	E3	2304	C6	3000	F11	3042	H10	3063	D12	3103	E4	3300	E4	3325	C5	3662	C4	3722	C7	6103	E3	7500	C3	9017	E6	9038	I8		
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2000	G10	2043	I9	2080	G8	2115	H4	2309	D5	3003	F11	3045	I10	3066	B10	3109	E3	3303	E3	3328	C5	3665	C4	4000	B12	7000	E11	7700	C8	9020	D8	9041	H6		
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2007	G10	2048	G10	2085	F9	2120	F4	2500	C2	3008	F12	3050	I9	3073	F9	3118	G5	3308	D5	3550	D6	3708	C10	4104	F5	7044	H9	9005	B5	9025	B10	9047	F6		
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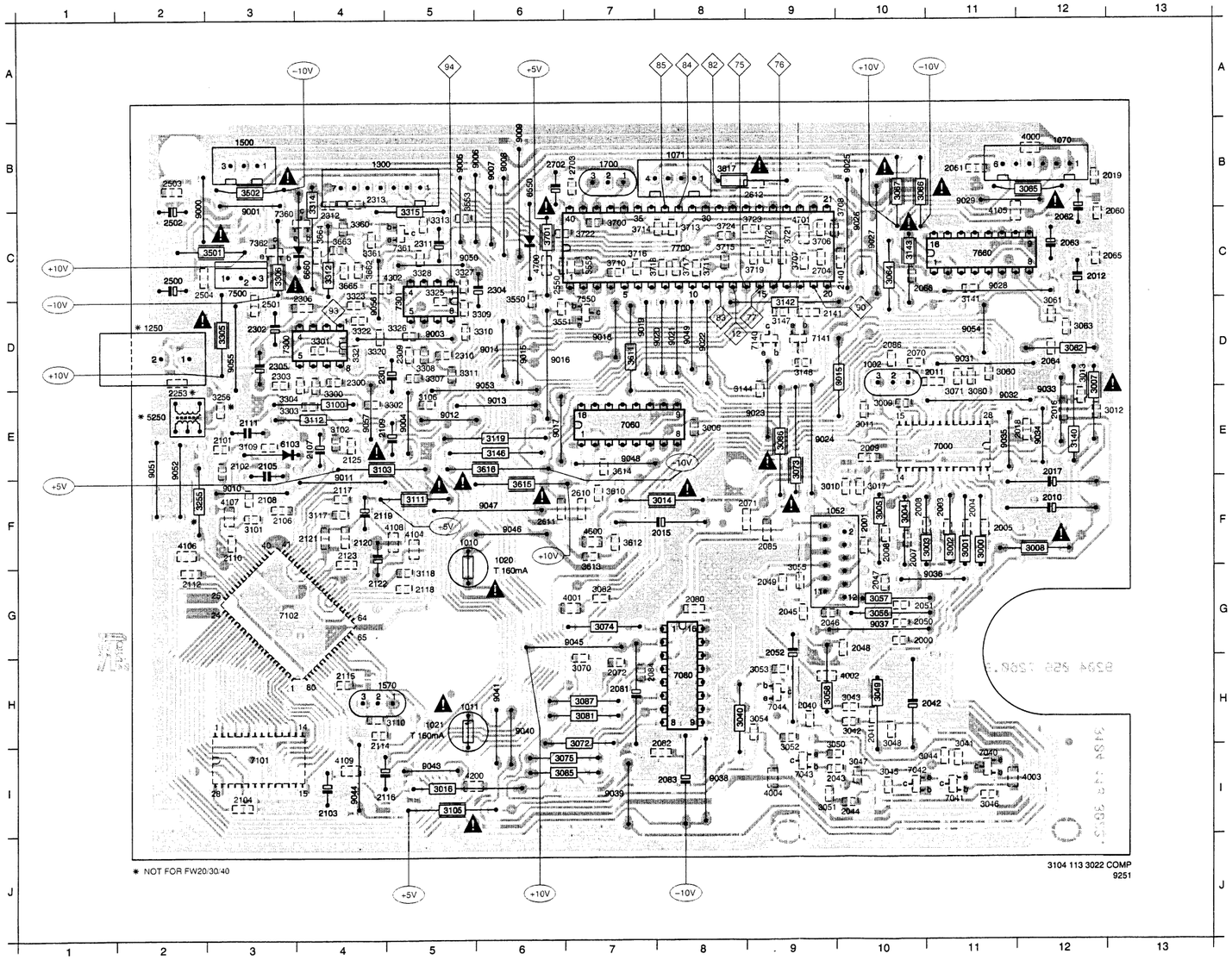
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1570
1250
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2012
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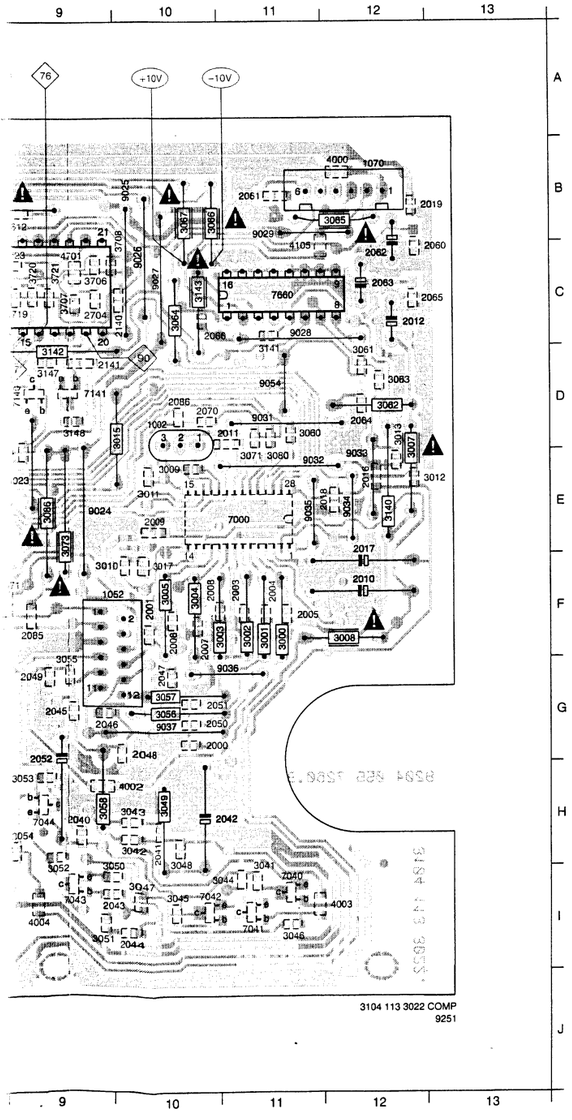
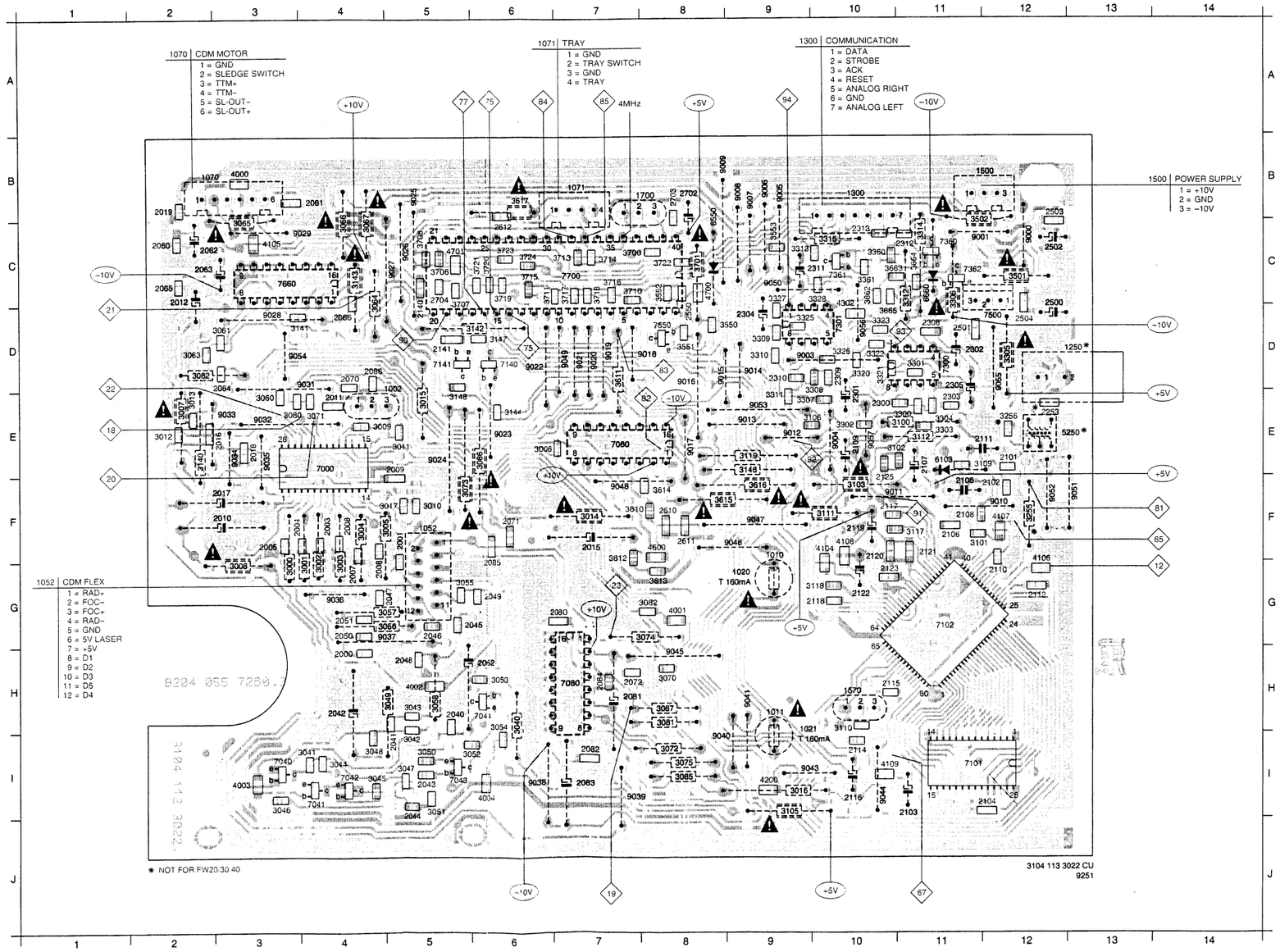
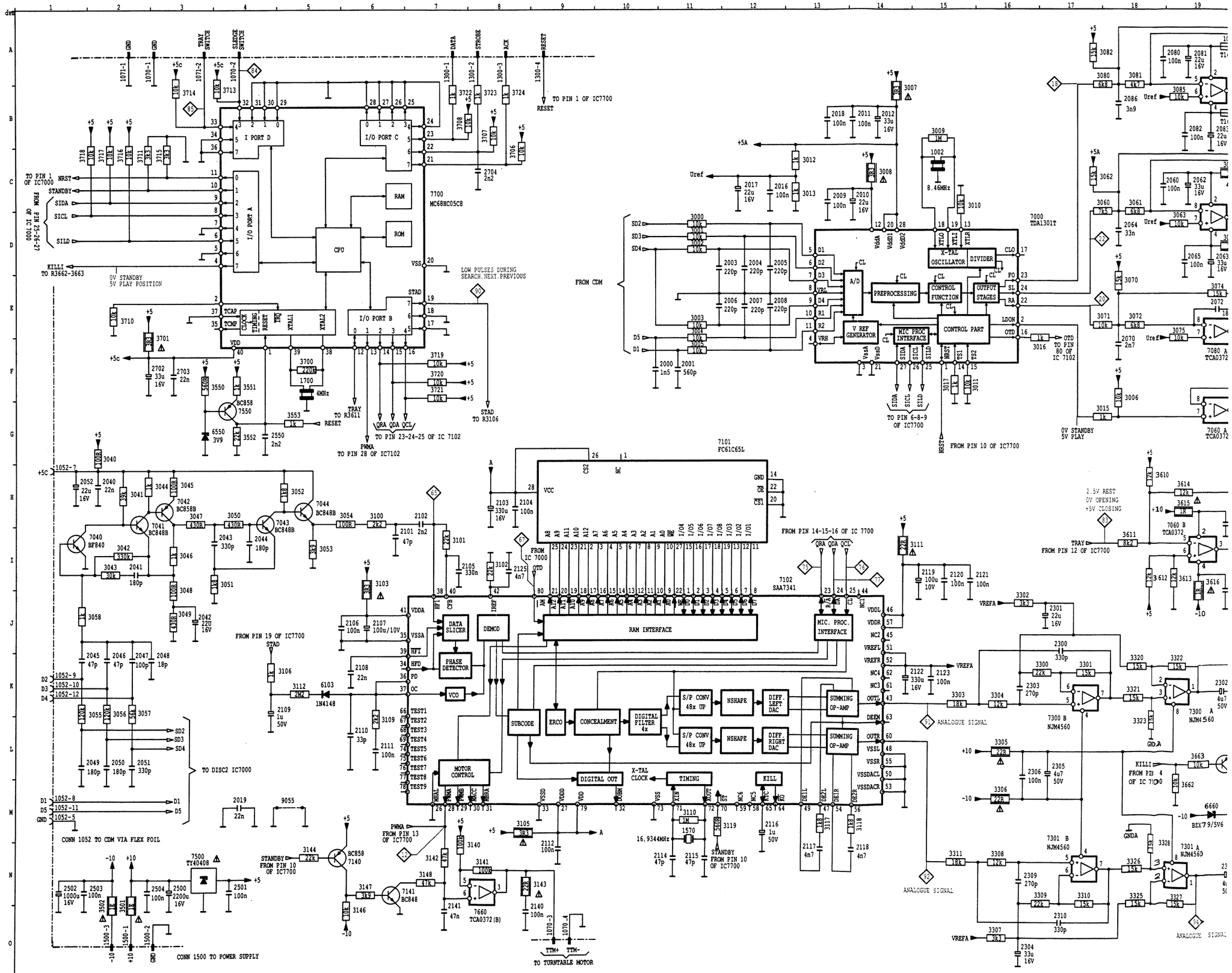
1002	E4	2007	G4	2046	G5	2081	H7	2114	I10	2304	D9	2703	B8	3016	I9	3056	G4	3081	H8	3140	E2	3308	E9	3501	C12	3700	C7	3724	C6	6103	E11	7361	C10	9013	E9	9032	E3	9051	F13
1010	F9	2008	F4	2047	G5	2082	I7	2115	H10	2305	D11	2704	C5	3017	F4	3057	G4	3082	G7	3141	D3	3309	D9	3502	C11	3701	C8	4000	B3	6550	C8	7362	C11	9014	D9	9033	E3	9052	F12
1011	H9	2008	G4	2048	H5	2083	I7	2116	I10	2306	D11	3000	G3	3040	I6	3058	H5	3085	I8	3142	D5	3310	D9	3550	D8	3706	C5	4001	G8	6660	C11	7500	D12	9015	D8	9034	E3	9053	E9
1020	G9	2009	E5	2049	G6	2084	H7	2117	F10	2309	D10	3001	G4	3041	I3	3060	E3	3086	E6	3143	C4	3311	E9	3551	D8	3707	D5	4002	H5	7000	E4	7550	D8	9016	D8	9035	E3	9054	D3
1021	I9	2010	F2	2050	G4	2085	G6	2118	G9	2310	D9	3002	G4	3042	I5	3061	D2	3087	H8	3144	E6	3312	D11	3552	C8	3708	C5	4003	I3	7040	I3	7660	C3	9017	E8	9036	G4	9055	E12
1052	F5	2011	E4	2051	G4	2086	D4	2119	F10	2311	C9	3003	G4	3043	H5	3062	D2	3100	E10	3146	E9	3313	C9	3553	C9	3710	C7	4004	I6	7041	I4	7700	C7	9018	D7	9037	G4	9056	D10
1070	B2	2012	C2	2052	H6	2101	E12	2120	F10	2312	C10	3004	F4	3044	I4	3063	D2	3101	F11	3147	D6	3314	C11	3610	F7	3711	C6	4104	F10	7042	I4	9000	C12	9019	D7	9038	I6	9057	E10
1071	B7	2015	F7	2060	C2	2102	F11	2121	F11	2313	C10	3005	F5	3045	I4	3064	D4	3102	E10	3148	E5	3315	C10	3611	D7	3713	C6	4105	C3	7043	I5	9001	C11	9020	D7	9039	I7		
1250	D12	2016	E3	2061	B4	2103	I11	2122	G10	2500	D12	3006	E6	3046	I3	3065	C3	3103	F10	3255	F12	3320	D10	3612	F7	3714	C7	4106	F12	7044	H6	9003	D9	9021	D7	9040	I8		
1300	B10	2017	F2	2062	C2	2104	I11	2123	G10	2501	D11	3007	E2	3047	I5	3066	C4	3105	I9	3256	E12	3321	D10	3613	G8	3715	C6	4107	F12	7060	E7	9004	E10	9022	D6	9041	H9		
1500	B11	2018	E3	2063	C2	2105	F11	2125	F10	2502	C12	3008	G3	3048	I4	3067	C4	3106	E9	3300	E10	3322	D10	3614	F8	3716	C7	4108	F10	7080	H7	9005	B9	9023	E6	9043	I9		
1570	H10	2019	B2	2064	D2	2106	F11	2140	D5	2503	B12	3009	E4	3049	H5	3070	H8	3109	E11	3301	D11	3323	D10	3615	F8	3717	C7	4109	I10	7101	I11	9006	B9	9024	E5	9044	I10		
1700	B7	2040	H5	2065	C2	2107	E11	2141	D5	2504	D12	3010	F5	3050	I5	3071	E4	3110	H10	3302	E10	3325	D9	3616	F9	3718	C7	4200	I9	7102	G11	9007	B9	9025	B5	9045	H8		
2000	H4	2041	I5	2066	D4	2108	F11	2253	E12	2550	D8	3011	E5	3051	I5	3072	I8	3111	F10	3303	E11	3326	D10	3617	B6	3719	C6	4302	D10	7140	D6	9008	B9	9026	C5	9046	F8		
2001	F5	2042	H4	2070	D4	2109	E10	2300	E10	2610	F8	3012	E2	3052	I5	3073	F5	3112	E11	3304	E11	3327	C9	3662	C10	3720	C6	4600	F8	7141	D5	9009	B8	9027	C5	9047	F9		
2003	F4	2043	I5	2071	F6	2110	G12	2301	E10	2611	F8	3013	E2	3053	H6	3074	G7	3117	F11	3305	D12	3328	C9	3663	C10	3721	C6	4700	C8	7300	D11	9010	F12	9028	D3	9048	F7		
2004	F3	2044	J5	2072	H7	2111	E11	2302	D11	2612	C6	3014	F7	3054	H6	3075	I8	3118	G9	3306	D11	3360	C10	3664	C11	3722	C8	4701	C5	7301	D10	9011	F10	9029	C3	9049	D7		
2005	F3	2045	G5	2080	G6	2112	G12	2303	E11	2702	B8	3015	E5	3055	G5	3080	E3	3119	E9	3307	E9	3361	C10	3665	D10	3723	C6	5250	E12	7360	C11	9012	E9	9031	D3	9050	C9		





CD CIRCUIT DIAGRAM



DATA
STROBE
ACK
RESET
TO PIN 1 OF IC7700
RESET
7700
MC68HC05C8
LOW PULSES DURING SEARCH.NEXT.PREVIOUS
STAD TO R3106
FROM CDM
7000 TDA1301T
X-TAL OSCILLATOR
DIVIDER
A/D
PREPROCESSING
CONTROL FUNCTION
OUTPUT STAGES
V REF GENERATOR
MIC PROC INTERFACE
CONTROL PART
8.46MHz
SIDA SICL SILD
TO PIN 6-8-9 OF IC7700
NRST
FROM PIN 10 OF IC7700
OTD TO PIN 80 OF IC 7102
0V STANDBY 5V PLAY
7660 A TCA0372
7080 B TCA0372
7080 A TCA0372
7060 A TCA0372
7160mA
SL-OUT+
SL-OUT-
RAD+
RAD-
5V LASER
7101 FC61C65L
FROM IC 7000
FROM PIN 14-15-16 OF IC 7700
7102 SAA7341
RAM INTERFACE
MIC. PROC. INTERFACE
DATA SLICER
DEMOD
PHASE DETECTOR
VCO
SUBCODE
ERCO
CONCEALMENT
DIGITAL FILTER 4x
S/P CONV 48x UP
NSHAPE
DIFF. LEFT DAC
DIFF. RIGHT DAC
SUMMING OP-AMP
DIGITAL OUT
X-TAL CLOCK
TIMING
KILL
MOTOR CONTROL
16,9344MHz
STANDBY FROM PIN 10 OF IC7700
TTM+ TTM-
TO TURNTABLE MOTOR
7660 TCA0372 (B)
7300 B NJM4560
7301 B NJM4560
7300 A NJM4560
7301 A NJM4560
7362 BC858
7360 BC817-25
7361 BC817-25
6660 BZX79/5V6
KILLI FROM PIN 4 OF IC 7700
2.5V REST 0V OPENING +5V CLOSING
0V REST +5V OPENING -5V CLOSING
TRAY FROM PIN 12 OF IC7700
ANALOGUE SIGNAL
LEFT
RIGHT
GND
TRAY
FOC+
FOC-
3104 118 01001S-A 9301

1002	C15	3052	H 5
1020	A20	3053	I 5
1021	B20	3054	H 6
1052	K 1	3055	L 2
1052	K 1	3056	L 2
1052	M 1	3057	K 2
1052	M 1	3058	J 2
1052	K 1	3060	C18
1052	M 1	3061	C18
1052	H 1	3062	C17
1052	B21	3063	D19
1052	G21	3064	C21
1052	F21	3065	D20
1052	E21	3066	D19
1052	B21	3067	C19
1070	O 9	3070	E18
1070	A 4	3071	E18
1070	M 1	3072	E18
1070	A 2	3073	F20
1070	D21	3074	E19
1070	D21	3075	E19
1071	A 3	3080	A18
1071	A 3	3081	A18
1071	I21	3082	A17
1071	I21	3085	B19
1300	A 9	3086	B20
1300	A 8	3087	A21
1300	A 8	3100	H 6
1300	A 7	3101	I 7
1300	K21	3102	I 8
1300	N21	3103	L 6
1300	M21	3105	M 8
1500	O 2	3106	K 5
1500	O 2	3109	L 6
1500	O 2	3110	M11
1570	M11	3111	I14
1700	F 5	3112	K 5
2000	F11	3117	M13
2001	F11	3118	M14
2003	D12	3119	M12
2004	D12	3140	N 8
2005	D12	3141	N 8
2006	E12	3142	N 9
2007	E12	3143	N 9
2008	E12	3144	N 9
2009	C12	3146	O 8
2010	C14	3147	N 6
2011	B14	3148	N 7
2012	B12	3301	K16
2015	G20	3302	K17
2016	C12	3303	J16
2017	G12	3304	K15
2018	B12	3305	L16
2019	M 4	3306	M16
2040	H 2	3307	O16
2041	I 3	3308	N16
2042	J 3	3309	N16
2043	I 4	3310	N17
2044	F 4	3311	N15
2045	K 1	3312	K20
2046	K 2	3313	N20
2047	K 2	3314	K20
2048	K 3	3315	N20
2049	L 1	3320	K18
2050	L 2	3321	K18
2051	L 2	3322	K19
2052	H 1	3323	L18
2060	C18	3325	N18
2061	D20	3326	N18
2062	C19	3327	N19
2063	D19	3328	M18
2064	D18	3360	L20
2065	D19	3361	M20
2066	C20	3362	M20
2070	F18	3501	O 2
2071	F20	3502	O 3
2072	E19	3550	F 3
2080	A19	3551	F 4
2081	A19	3552	G 4
2082	B19	3553	G 3
2083	B19	3610	H18
2084	A20	3611	I18
2085	B20	3612	I19
2086	B18	3613	I19
2101	I 6	3614	H19
2102	H 7	3615	H19
2103	H 8	3616	I19
2104	H 8	3617	I20
2105	I 7	3662	M19
2106	J 6	3663	L19
2107	J 6	3664	M20
2108	K 6	3665	M20
2109	K 5	3700	F 5
2110	L 6	3701	F 3
2111	L 6	3706	C 8
2112	N 9	3707	B 9
2114	M11	3708	B 9
2115	M11	3710	E 2
2116	M12	3711	C 2
2117	N13	3712	B 4
2118	M14	3713	B 3
2119	I15	3715	C 3
2120	I15	3716	C 2
2121	I15	3717	C 1
2122	K14	3718	C 1
2123	K15	3719	F 7
2125	I 8	3720	F 7
2140	O 7	3721	F 7
2141	O 7	3722	B 7
2300	J17	3723	B 8
2301	J17	3724	B 8
2302	K19	6103	K 5
2303	K16	6550	G 4
2304	O16	6660	M19
2305	L17	7000	D16
2306	L16	7040	I 2
2309	N16	7041	I 2
2310	O17	7042	H 3
2311	N19	7043	H 4
2312	K21	7044	H 5
2313	N21	7060	I19
2500	N 3	7080	G19
2501	N 4	7080	F19
2502	N 3	7080	A20
2503	N 2	7101	G11
2504	M 3	7102	I12
2550	G 4	7140	N 6
2610	B20	7141	N 6
2611	T20	7300	L17
2612	I20	7300	K19
2702	F 2	7301	M17
2703	F 3	7301	N19
2704	C 8	7360	L20
3000	D11	7361	M20
3001	D11	7362	L20
3002	D11	7500	N 3
3003	B11	7550	G 4
3004	E11	7660	O 8
3005	F11	7660	C20
3006	F18	7700	C 7
3007	B14	9055	M 5
3008	C14		
3009	B15		
3011	F16		
3012	C13		
3013	C13		
3014	C20		
3015	G18		
3016	F16		
3017	F15		
3040	G 2		
3041	H 2		
3042	I 2		
3043	I 2		
3044	H 3		
3045	I 3		
3046	I 3		
3047	J 3		
3048	J 3		
3049	G 3		
3050	H 4		
3051	I 4		

22 — 0V, 10us/DIV — ± 44,4us play mode; stand by +5V

23 — service mode SERVO xx; 5V / 0V FM not moving; 0,5us/DIV; service mode FOCUS; 5V / 0V FM is moving

20 — service mode MOTOR; 5V / 0V no tracking control; 0,5us/DIV; service mode RADIAL; 5V / 0V tracking control

24 — service mode SLEDGE; 5V / 0V sledge not moving; 0,5us/DIV; 5V / 0V sledge out; 5V / 0V sledge in

25 — eyepattern; 2.5V; 0,5us/DIV

27 — SERVICE POSITION SLEDGE FOCUS MOTOR: 0V
SERVICE POSITION RADIAL: 5V

7 — play mode; 10ms/DIV; QRA asynchronous uP dependent

7 — 10 X 8 bits; 0.2ms/DIV; QCL

7 — QDA continue data

34 — SERVICE POSITION SLEDGE
0V REST POSITION
+5V WHEN SLEDGE IS MOVING

33 — +5V REST POSITION IF TRAY
0V WHEN OPENING OR CLOSING

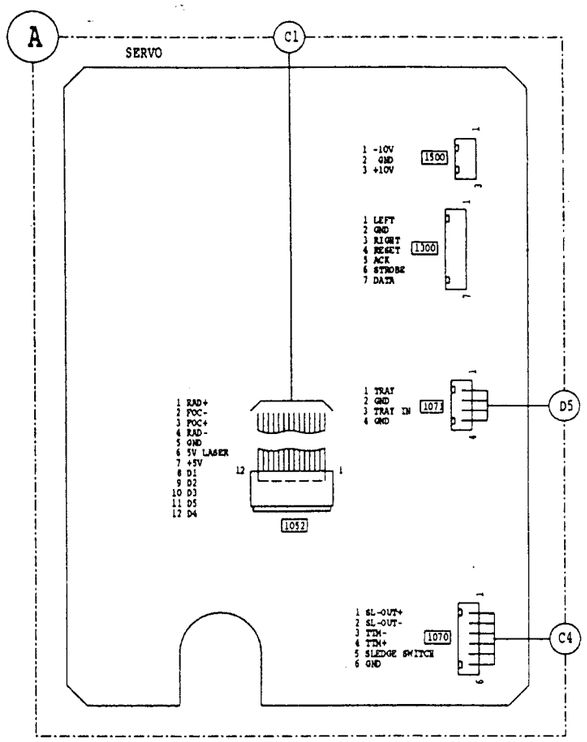
30 — LOW PULSES DURING SEARCH.NEXT.PREVIOUS

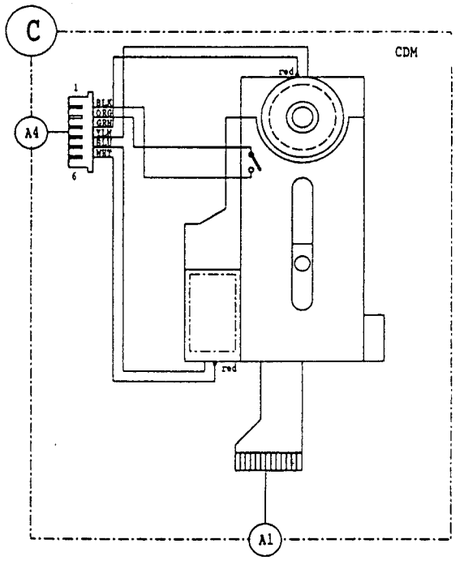
19 — ACTIVITY DURING PLAY

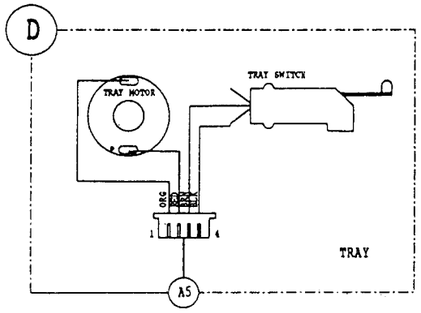
21 — ACTIVITY DURING PLAY

23 — SERVICE POSITION SLEDGE
SL-OUT +2.6V
SL-IN +2.6V

WIRING DIAGRAM CD-PART





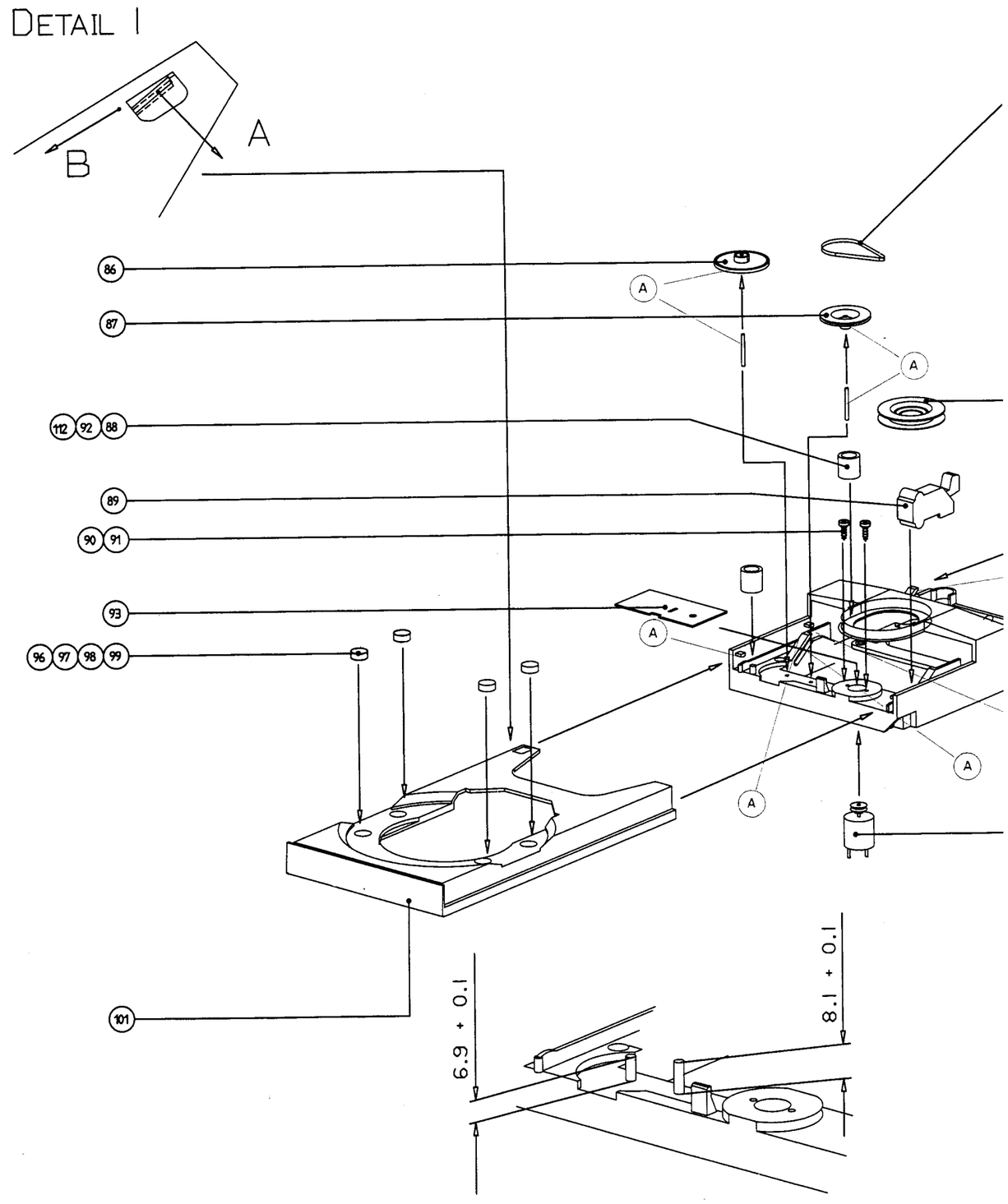


CD MECHANISM

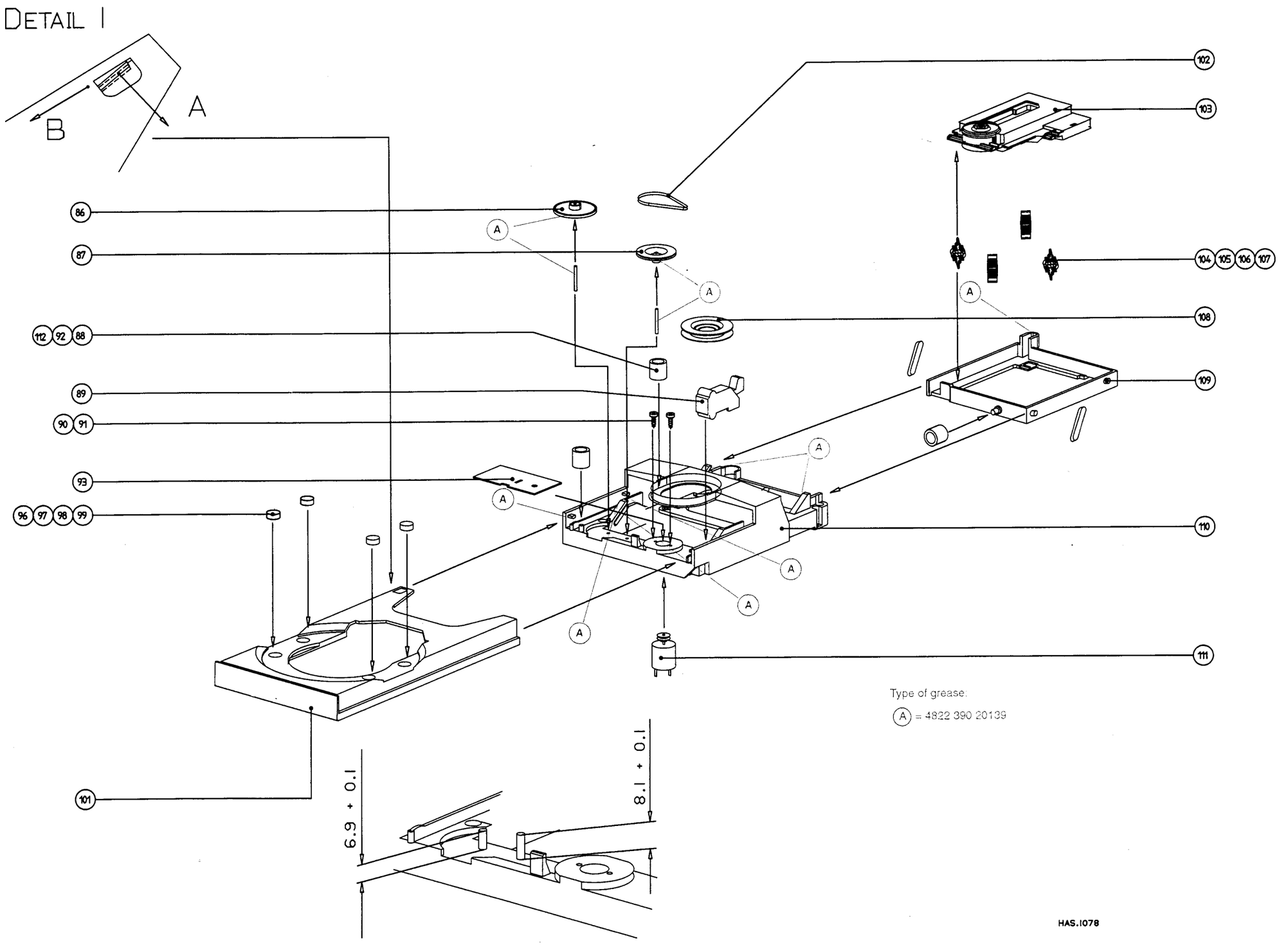
86	4822 528 81464
87	4822 528 81465
88	4822 325 60379
89	4822 276 13222
93	4822 444 60816
96	4822 325 80511
101	4822 444 50679
102	4822 358 31168
103	4822 691 30278
104	4822 325 50215
108	4822 402 61412
109	4822 464 50895
110	4822 444 50678
111	4822 361 21492

Note : Only the mentioned parts are normal service parts.

CD EXPLODED VIEW



CD EXPLODED VIEW

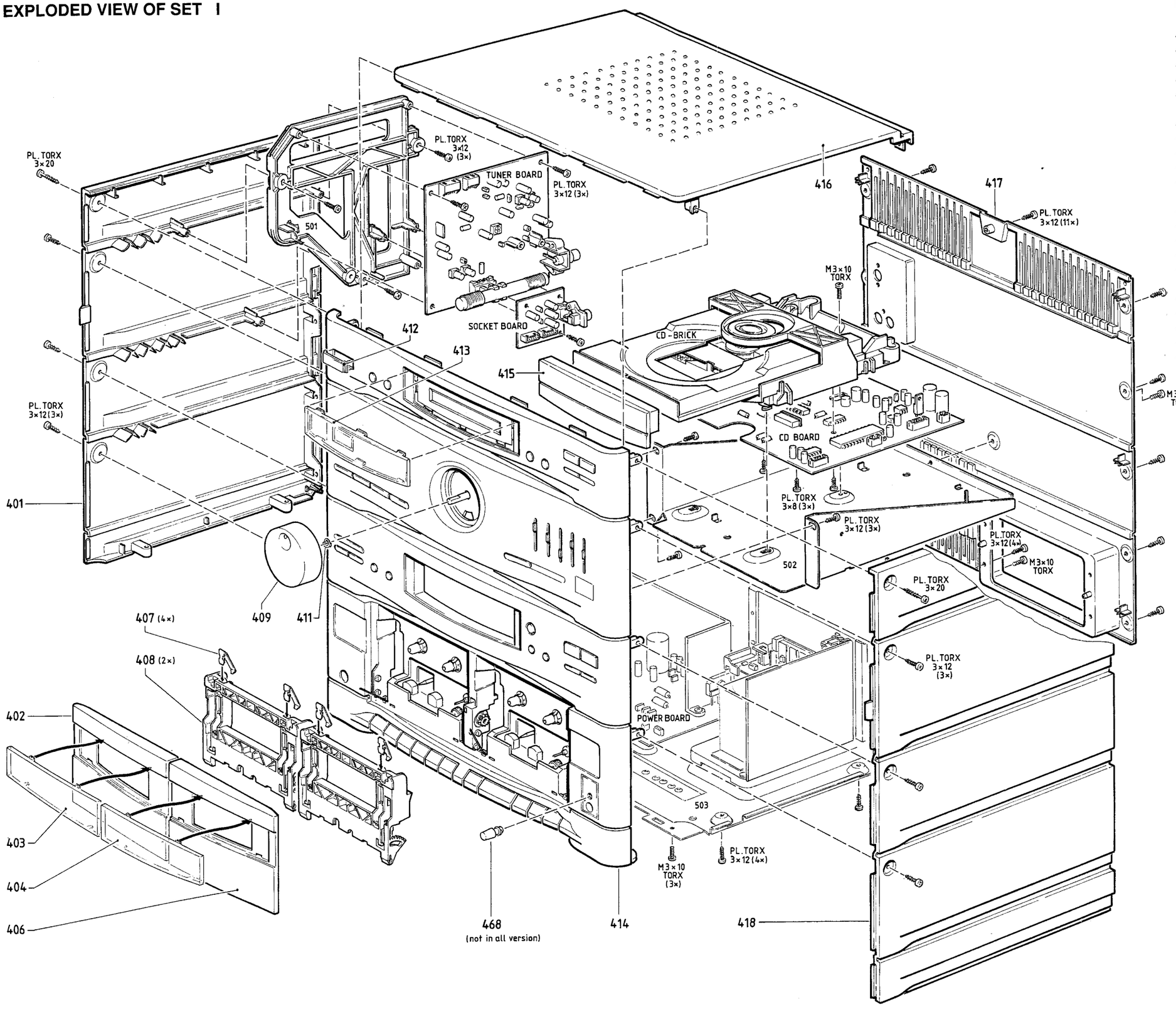


Type of grease.

(A) = 4822 390 20139

HAS.1078

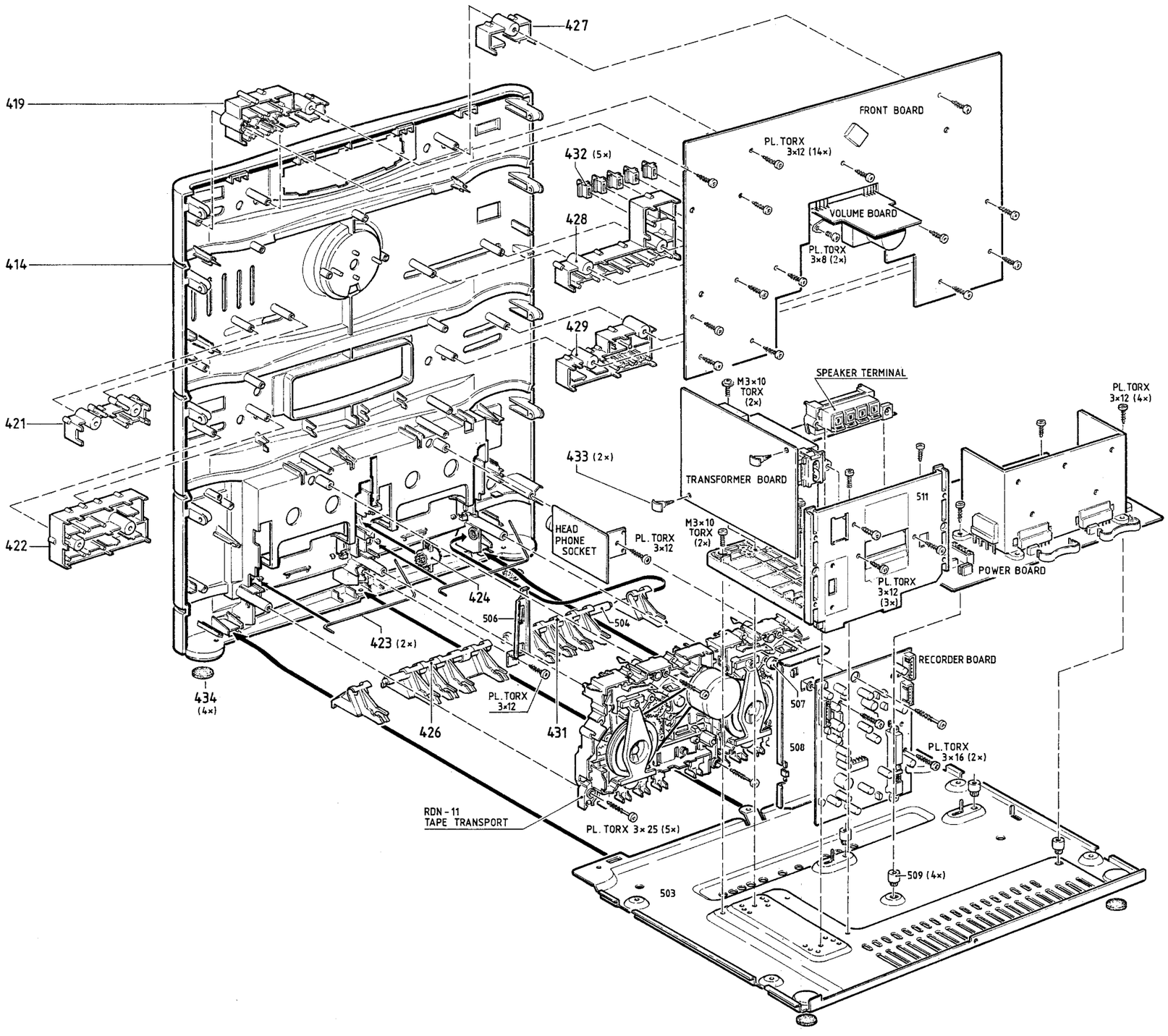
EXPLODED VIEW OF SET I



MECHANICAL PARTS

401	4822 426 30153	SIDE LEFT
402	4822 443 63936	CASS. DOOR A-DECK
403	4822 450 62087	WINDOW A-DECK
404	4822 450 62088	WINDOW B-DECK
406	4822 443 63935	CASS. DOOR B-DECK
407	4822 492 63927	SPRING,CASS.PRESS
408	4822 443 63037	DOOR,CASSETTE
409	4822 413 41792	KNOB VOLUME
411	4822 492 51374	SPRING KNOB CLAMP
412	4822 381 11418	IR WINDOW
413	4822 450 62074	WINDOW PRINTED
414	4822 426 51661	FRONT AS445/20
414	4822 426 51644	FRONT AS445/21,/30
414	4822 426 51643	FRONT AS440/37
414	4822 426 51642	FRONT AS440/20/22/25
415	4822 444 40661	FRONT CD TRAY
416	4822 426 60639	COVER
417	4822 426 20241	BACK PLATE
418	4822 426 30152	SIDE RIGHT
468	4822 410 62622	KNOB MICRO-MIX

EXPLODED VIEW OF SET II



MECHANICAL PARTS

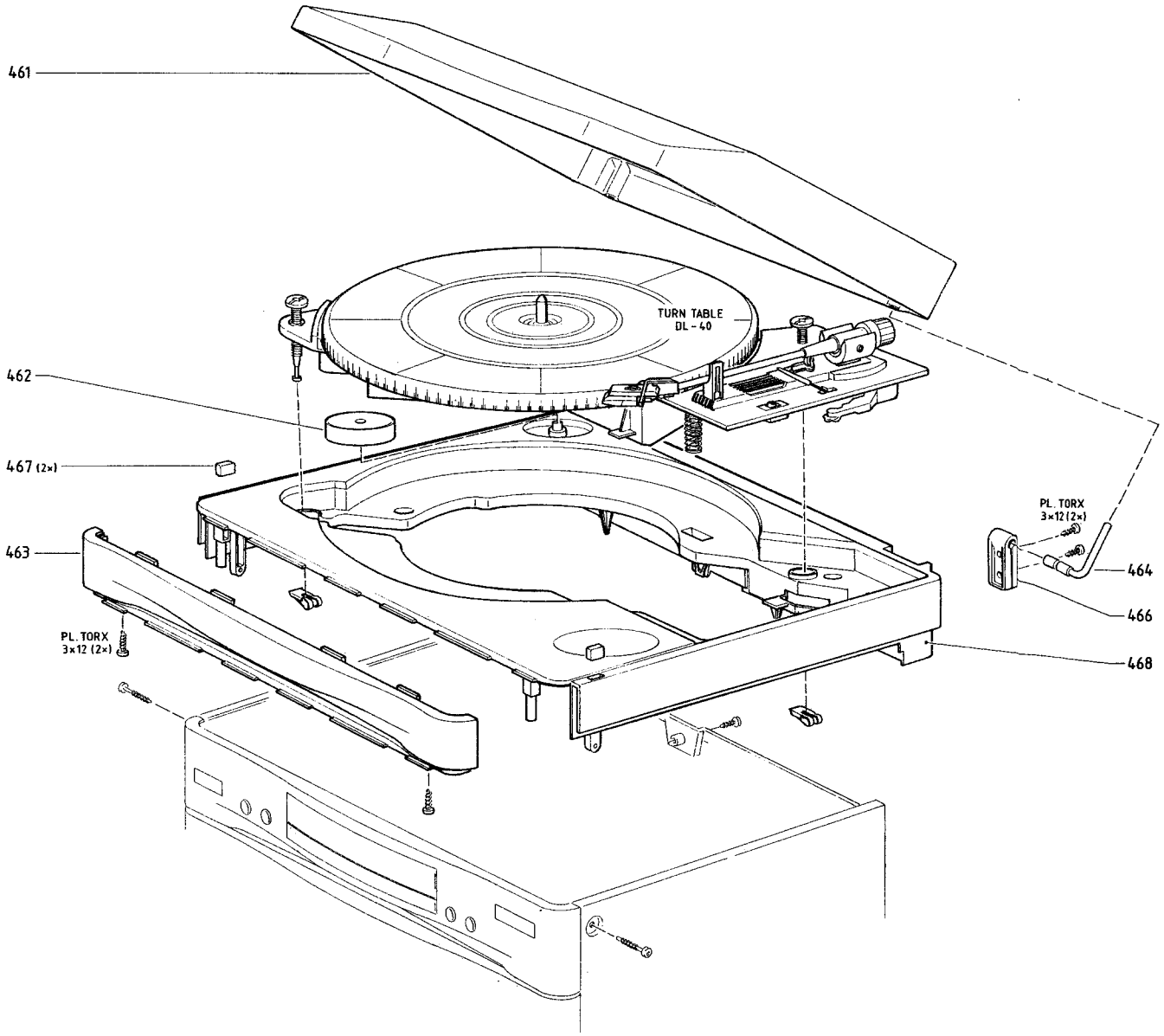
414 4822 426 51661 FRONT AS445/20
414 4822 426 51644 FRONT AS445/21,/30
414 4822 426 51643 FRONT AS440/37
414 4822 426 51642 FRONT AS440/20/22/25
419 4822 410 62618 KNOB PRSET UP/DOWN

421 4822 410 62624 KNOB HSD
422 4822 410 62626 KNOB CD RIGHT
423 4822 492 42595 SPRING CASS. COMPARTMENT
424 4822 529 10278 DAMPER
426 4822 410 62619 BUTTON SET

428 4822 410 62623 KNOB AUTOPROGRAM
428 4822 410 62617 KNOB SELECTOR+POWER
429 4822 410 62625 KNOB CD LEFT
431 4822 410 62621 BUTTON SET
432 4822 411 61929 KNOB EQUALIZER

433 4822 466 93148 SPACER
434 4822 462 40683 FOOT RUBBER
4822 691 20842 RDN-11 TAPE TRANSPORTS

ONLY FOR SETS WITH RECORD PLAYER



MECHANICAL PARTS TURNTABLE

461 4822 462 71935 DUST COVER
462 4822 466 92642 ADAPTOR
463 4822 444 40662 FRONT TURNTABLE
464 4822 417 10631 CLAMPING BLOCK
466 4822 417 10631 CLAMPING BLOCK

467 4822 462 41656 RUBBER PAD
468 not a sparepart

MICRO MIX BOARD

MISCELLANEOUS

1900	4822 267 30968	PHONE SOCKET

INTEGRATED CIRCUITS

7900	4822 209 83274	NJM4560D

RESISTORS

3900	4822 116 52256	2k2	5%	0,16W
3901	4822 116 52175	100R	5%	0,5W
3902	4822 116 52224	470R	5%	0,5W
3903	4822 116 52234	100k	5%	0,5W
3904	4822 116 52234	100k	5%	0,5W
3905	4822 100 11869	TRIMPOT 20k LIN.		
3906	4822 116 52175	100R	5%	0,5W
3907	4822 116 52234	100k	5%	0,5W
3908	4822 116 52238	12k	5%	0,5W
3909	4822 116 52233	10k	5%	0,5W
3910	4822 116 52224	470R	5%	0,5W
3911	4822 116 52238	12k	5%	0,5W
3912	4822 116 52303	8k2	5%	0,5W

CAPACITORS

2900	4822 124 40242	1µF	20%	63V
2901	4822 122 33195	100pF	10%	50V
2902	4822 122 33519	470pF	10%	50V
2903	4822 122 33848	47pF	5%	50V
2904	4822 124 40435	10µF	20%	50V
2905	4822 122 33848	47pF	5%	50V
2906	4822 122 33848	47pF	5%	50V
2907	4822 124 40435	10µF	20%	50V
2908	4822 124 40435	10µF	20%	50V
2909	4822 122 33195	100pF	10%	50V
2910	4822 122 33519	470pF	10%	50V
2911	4822 122 33848	47pF	5%	50V
2913	4822 124 40242	1µF	20%	63V
2914	4822 122 33848	47pF	5%	50V
2915	4822 124 40435	10µF	20%	50V
2916	4822 124 40435	10µF	20%	50V
2917	4822 124 41525	100µF	20%	25V
2918	4822 126 11585	22nF	50V	
2919	4822 124 40433	47µF	20%	25V

FRONT BOARD

MISCELLANEOUS

1408	4822 267 30631	CINCH SOCKET
1410	4822 267 30968	PHONE SOCKET
1415	4822 130 91245	FTD-11894
1416	4822 134 40965	LAMP INC. 12V 150mA
1417	4822 134 40965	LAMP INC. 12V 150mA
1421	4822 276 13114	TACT SWITCH
1422	4822 276 13114	TACT SWITCH
1424	4822 276 13114	TACT SWITCH
1425	4822 276 13114	TACT SWITCH
1426	4822 276 13114	TACT SWITCH
1427	4822 276 13114	TACT SWITCH
1428	4822 276 13114	TACT SWITCH
1429	4822 276 13114	TACT SWITCH
1430	4822 276 13114	TACT SWITCH
1431	4822 276 13114	TACT SWITCH
1432	4822 276 13114	TACT SWITCH
1433	4822 276 13114	TACT SWITCH
1434	4822 276 13114	TACT SWITCH
1435	4822 276 13114	TACT SWITCH
1436	4822 276 13114	TACT SWITCH
1437	4822 276 13114	TACT SWITCH
1438	4822 276 13114	TACT SWITCH
1439	4822 276 13114	TACT SWITCH
1440	4822 276 13114	TACT SWITCH
1441	4822 276 13114	TACT SWITCH
1442	4822 276 13114	TACT SWITCH
1443	4822 276 13114	TACT SWITCH
1444	4822 276 13114	TACT SWITCH
1446	4822 276 13114	TACT SWITCH
1447	4822 276 13114	TACT SWITCH
1448	4822 276 13114	TACT SWITCH

DIODES

6401	4822 130 30621	1N4148
6402	4822 130 30621	1N4148
6403	4822 130 30621	1N4148
6404	4822 130 30621	1N4148
6405	4822 130 30621	1N4148
6406	4822 130 30621	1N4148
6407	4822 130 30621	1N4148
6408	4822 130 30621	1N4148
6409	4822 130 30621	1N4148
6410	4822 130 30621	1N4148
6411	4822 130 30621	1N4148
6412	4822 130 30621	1N4148
6413	4822 130 30621	1N4148
6414	4822 130 30621	1N4148
6415	4822 130 30621	1N4148
6416	4822 130 30621	1N4148
6418	4822 130 30621	1N4148
6419	4822 130 30621	1N4148
6420	4822 130 30621	1N4148
6421	4822 130 30621	1N4148
6422	4822 130 30621	1N4148
6423	4822 130 30621	1N4148
6424	4822 130 30621	1N4148
6425	4822 130 30621	1N4148
6427	4822 130 34174	BZX79-C4V7
6428	4822 130 34197	BZX79-C12 (UAW)
6431	4822 130 34174	BZX79-C4V7
6442	4822 130 82021	LTL307G

DIODES

6450	4822 130 30861	BZX79-C7V5
6453	4822 130 30621	1N4148
1006	4822 130 83092	LED from Volume pot

TRANSISTORS

7406	4822 130 40941	BC558
7408	4822 130 40938	BC548
7409	4822 130 41344	BC337-40
7410	4822 130 41344	BC337-40
7411	4822 130 41344	BC337-40
7412	4822 130 41344	BC337-40
7413	4822 130 40938	BC548
7421	4822 130 44196	BC548C
7423	4822 130 40941	BC558
7424	4822 130 41327	BC327-40
7426	4822 130 40941	BC558
7427	4822 130 40938	BC548
7432	4822 130 40938	BC548
7433	4822 130 40938	BC548
7440	4822 130 40941	BC558
7445	5322 130 44779	BC338-40
7446	5322 130 44779	BC338-40
7447	4822 130 44246	BC549C
7448	4822 130 44246	BC549C

INTEGRATED CIRCUITS

7403	4822 209 83274	NJM4560D
7407	4822 209 83274	NJM4560D
7415	4822 209 32392	TMP87CK20F-AS440.1
7418	4822 209 31508	ST24C01
7419	5322 209 10421	HEF4094BP
7420	5322 209 10421	HEF4094BP
7422	4822 214 52009	GP1U58XP
7425	5322 209 86518	MC7805CT

COILS

5401	5322 242 73697	CERAM.RES. 8MHz
5402	4822 157 50961	22µH
5405	4822 157 62552	COIL 2,2µH

RESISTORS

3401	4822 116 52297	68k	5%	0,5W
3402	4822 116 52297	68k	5%	0,5W
3403	4822 116 52264	27k	5%	0,5W
3404	4822 116 52264	27k	5%	0,5W
3405	4822 116 52284	47k	5%	0,5W
3406	4822 116 52284	47k	5%	0,5W
3407	4822 116 52269	3k3	5%	0,5W
3408	4822 116 52269	3k3	5%	0,5W
3409	4822 116 52263	2k7	5%	0,5W
3410	4822 116 52263	2k7	5%	0,5W
3413	4822 116 52234	100k	5%	0,5W
3414	4822 116 52234	100k	5%	0,5W
3415	4822 116 52233	10k	5%	0,5W
3416	4822 116 52233	10k	5%	0,5W
3417	4822 116 52284	47k	5%	0,5W
3418	4822 116 52284	47k	5%	0,5W
3419	4822 116 52284	47k	5%	0,5W
3420	4822 116 52284	47k	5%	0,5W
3421	4822 116 52284	47k	5%	0,5W
3422	4822 116 52284	47k	5%	0,5W

RESISTORS

3423	4822 116 52284	47k	5%	0,5W
3424	4822 116 52284	47k	5%	0,5W
3425	4822 116 52224	470R	5%	0,5W
3426	4822 116 52224	470R	5%	0,5W
3427	4822 116 52257	22k	5%	0,5W
3428	4822 116 52257	22k	5%	0,5W
3431	4822 116 52263	2k7	5%	0,5W
3432	4822 116 52263	2k7	5%	0,5W
3433	4822 116 52276	3k9	5%	0,5W
3434	4822 116 52276	3k9	5%	0,5W
3435	4822 050 11002	1k	5%	0,2W
3436	4822 050 11002	1k	5%	0,2W
3437	4822 116 52264	27k	5%	0,5W
3438	4822 116 52264	27k	5%	0,5W
3439	4822 116 52224	470R	5%	0,5W
3440	4822 116 52224	470R	5%	0,5W
3441	4822 116 52224	470R	5%	0,5W
3442	4822 116 52224	470R	5%	0,5W
3443	4822 116 52291	56k	5%	0,5W
3444	4822 116 52291	56k	5%	0,5W
3445	4822 051 10333	33k	2%	0,25W
3446	4822 051 10333	33k	2%	0,25W
3447	4822 051 10333	33k	2%	0,25W
3448	4822 051 10333	33k	2%	0,25W
3449	4822 116 52264	27k	5%	0,5W
3450	4822 116 52264	27k	5%	0,5W
3451	4822 051 10333	33k	2%	0,25W
3452	4822 051 10333	33k	2%	0,25W
3455	4822 051 10333	33k	2%	0,25W
3456	4822 051 10333	33k	2%	0,25W
3457	4822 116 52264	27k	5%	0,5W
3458	4822 116 52264	27k	5%	0,5W
3459	4822 051 10333	33k	2%	0,25W
3460	4822 051 10333	33k	2%	0,25W
3461	4822 051 10333	33k	2%	0,25W
3462	4822 051 10333	33k	2%	0,25W
3463	4822 116 52285	470k	5%	0,5W
3464	4822 116 52285	470k	5%	0,5W
3465	4822 116 52296	6k8	5%	0,5W
3466	4822 116 52296	6k8	5%	0,5W
3469	4822 116 52283	4k7	5%	0,5W
3470	4822 116 52283	4k7	5%	0,5W
3471	4822 116 52256	2k2	5%	0,16W
3472	4822 116 52256	2k2	5%	0,16W
3473	4822 116 52257	22k	5%	0,5W
3474	4822 116 52257	22k	5%	0,5W
3475	4822 116 52224	470R	5%	0,5W
3476	4822 116 52224	470R	5%	0,5W
3477	4822 116 52256	2k2	5%	0,16W
3478	4822 116 52283	4k7	5%	0,5W
3480	4822 102 10414	Pot 2x20kB		
3481	4822 101 21102	Pot 2x 50k		
3482	4822 101 21102	Pot 2x 50k		
3483	4822 101 21102	Pot 2x 50k		
3484	4822 101 21102	Pot 2x 50k		
3485	4822 101 21102	Pot 2x 50k		
3486	4822 050 11002	1k	5%	0,2W
3487	4822 050 11002	1k	5%	0,2W
3488	4822 050 11002	1k	5%	0,2W
3489	4822 050 11002	1k	5%	0,2W
3490	4822 116 52215	220R	5%	0,16W
3491	4822 116 52233	10k	5%	0,5W
3492	4822 116 52228	680R	5%	0,5W
3493	4822 116 52215	220R	5%	0,16W
3494	4822 116 52215	220R	5%	0,16W

RESISTORS

3495	4822 116 52215	220R	5%	0,16W
3496	4822 116 52215	220R	5%	0,16W
3497	4822 116 52257	22k	5%	0,5W
3498	4822 116 52233	10k	5%	0,5W
3499	4822 116 52215	220R	5%	0,16W
3500	4822 116 52217	270R	5%	0,5W
3501	4822 116 52269	3k3	5%	0,5W
3502	4822 050 11002	1k	5%	0,2W
3503	4822 050 11002	1k	5%	0,2W
3504	4822 116 52269	3k3	5%	0,5W
3505	4822 116 52251	18k	5%	0,5W
3506	4822 116 52175	100R	5%	0,5W
3507	4822 116 52217	270R	5%	0,5W
3508	4822 116 52217	270R	5%	0,5W
3516	4822 116 52233	10k	5%	0,5W
3517	4822 116 52233	10k	5%	0,5W
3526	4822 116 52228	680R	5%	0,5W
3528	4822 116 52304	82k	5%	0,5W
3530	4822 116 52233	10k	5%	0,5W
3531	4822 116 52283	4k7	5%	0,5W
3532	4822 116 52283	4k7	5%	0,5W
3533	4822 116 52283	4k7	5%	0,5W
3534	4822 116 52283	4k7	5%	0,5W
3535	4822 116 52283	4k7	5%	0,5W
3536	4822 116 52283	4k7	5%	0,5W
3537	4822 116 52217	270R	5%	0,5W
3538	4822 116 52217	270R	5%	0,5W
3539	4822 116 52217	270R	5%	0,5W
3540	4822 116 52258	220k	5%	0,5W
3552	4822 050 11002	1k	5%	0,2W
3554	4822 116 52233	10k	5%	0,5W
3555	4822 116 52233	10k	5%	0,5W
3556	4822 116 52233	10k	5%	0,5W
3557	4822 116 52233	10k	5%	0,5W
3558	4822 116 52256	2k2	5%	0,16W
3559	4822 116 52256	2k2	5%	0,16W
3560	4822 116 52283	4k7	5%	0,5W
3562	4822 050 11002	1k	5%	0,2W
3563	4822 116 52233	10k	5%	0,5W
3564	4822 050 11002	1k	5%	0,2W
3565	4822 050 11002	1k	5%	0,2W
3568	4822 116 52233	10k	5%	0,5W
3573	4822 050 11002	1k	5%	0,2W
3574	4822 116 52284	47k	5%	0,5W
3575	4822 050 11002	1k	5%	0,2W
3576	4822 051 10333	33k	2%	0,25W
3577	4822 116 52233	10k	5%	0,5W
3578	4822 116 52233	10k	5%	0,5W
3579	4822 116 52233	10k	5%	0,5W
3580	4822 116 52233	10k	5%	0,5W
3581	4822 116 52233	10k	5%	0,5W
3585	4822 116 52249	1k8	5%	0,16W
3586	4822 116 52175	100R	5%	0,5W
3587	4822 116 52175	100R	5%	0,5W
3589	4822 050 11002	1k	5%	0,2W
3590	4822 116 52257	22k	5%	0,5W
3591	4822 050 11002	1k	5%	0,2W
3592	4822 116 52257	22k	5%	0,5W
3593	4822 050 11002	1k	5%	0,2W
3594	4822 116 52224	470R	5%	0,5W
3595	4822 116 52224	470R	5%	0,5W
3596	4822 116 52224	470R	5%	0,5W
3597	4822 116 52224	470R	5%	0,5W
3598	4822 116 52256	2k2	5%	0,16W
3601	4822 116 52224	470R	5%	0,5W

RESISTORS

3602	4822 116 52224	470R	5%	0,5W
3603	4822 050 11002	1k	5%	0,2W
3604	4822 050 11002	1k	5%	0,2W
3605	4822 116 52207	1k2	5%	0,5W
3606	4822 116 52207	1k2	5%	0,5W
3607	4822 116 52256	2k2	5%	0,16W
3608	4822 116 52256	2k2	5%	0,16W
3609	4822 116 52296	6k8	5%	0,5W
3610	4822 116 52215	220R	5%	0,16W
3612	4822 116 52256	2k2	5%	0,16W
3613	4822 050 11002	1k	5%	0,2W
3615	4822 116 52224	470R	5%	0,5W
3616	4822 116 52215	220R	5%	0,16W
3617	4822 116 52228	680R	5%	0,5W
3618	4822 116 52233	10k	5%	0,5W
3620	4822 116 52233	10k	5%	0,5W
3621	4822 116 52224	470R	5%	0,5W
3622	4822 116 52224	470R	5%	0,5W
3623	4822 116 52224	470R	5%	0,5W
3624	4822 116 52224	470R	5%	0,5W
3649	4822 050 22205	2M2	1%	0,6W
3650	4822 050 22205	2M2	1%	0,6W
3651	4822 116 52257	22k	5%	0,5W
3652	4822 116 52257	22k	5%	0,5W
3653	4822 116 52235	1M	5%	0,5W
3654	4822 116 52235	1M	5%	0,5W
3655	4822 116 52224	470R	5%	0,5W
3660	4822 050 11002	1k	5%	0,2W
3661	4822 050 11002	1k	5%	0,2W
3662	4822 116 52224	470R	5%	0,5W
3663	4822 116 52224	470R	5%	0,5W
3664	4822 116 52228	680R	5%	0,5W
3665	4822 116 52256	2k2	5%	0,16W
3666	4822 116 52234	100k	5%	0,5W
3667	4822 116 52234	100k	5%	0,5W
3668	4822 050 11002	1k	5%	0,2W
3672	4822 050 11002	1k	5%	0,2W

CAPACITORS

2401	4822 124 40239	0,47µF	20%	63V
2402	4822 124 40239	0,47µF	20%	63V
2403	4822 124 40239	0,47µF	20%	63V
2404	4822 124 40239	0,47µF	20%	63V
2405	4822 124 40239	0,47µF	20%	63V
2406	4822 124 40239	0,47µF	20%	63V
2407	4822 124 40239	0,47µF	20%	63V
2408	4822 124 40239	0,47µF	20%	63V
2409	4822 122 33848	47pF	5%	50V
2410	4822 122 33848	47pF	5%	50V
2411	4822 122 33848	47pF	5%	50V
2412	4822 122 33848	47pF	5%	50V
2413	4822 122 33848	47pF	5%	50V
2414	4822 122 33848	47pF	5%	50V
2415	4822 122 33848	47pF	5%	50V
2416	4822 122 33848	47pF	5%	50V
2417	4822 126 12702	270pF	10%	50V
2418	4822 126 12702	270pF	10%	50V
2419	4822 122 33195	100pF	10%	50V
2420	4822 122 33195	100pF	10%	50V
2421	4822 122 33848	47pF	5%	50V
2422	4822 122 33848	47pF	5%	50V
2425	4822 122 33195	100pF	10%	50V
2426	4822 122 33195	100pF	10%	50V
2427	4822 124 40242	1µF	20%	63V

CAPACITORS

2428	4822 124 40242	1µF	20%	63V
2429	4822 126 12702	270pF	10%	50V
2430	4822 126 12702	270pF	10%	50V
2431	4822 122 33197	1nF	10%	50V
2432	4822 122 33197	1nF	10%	50V
2433	4822 122 33197	1nF	10%	50V
2434	4822 122 33197	1nF	10%	50V
2435	4822 126 11714	4,7nF	20%	
2436	4822 126 11714	4,7nF	20%	
2437	4822 126 11714	4,7nF	20%	
2438	4822 126 11714	4,7nF	20%	
2439	4822 126 11585	22nF		50V
2440	4822 126 11585	22nF		50V
2441	4822 126 11585	22nF		50V
2442	4822 126 11585	22nF		50V
2443	4822 121 43526	47nF	5%	100V
2444	4822 121 43526	47nF	5%	100V
2445	4822 121 42408	220nF	5%	63V
2446	4822 121 42408	220nF	5%	63V
2449	4822 122 33195	100pF	10%	50V
2450	4822 122 33195	100pF	10%	50V
2451	4822 124 40246	4,7uF	20%	63V
2452	4822 124 40246	4,7uF	20%	63V
2453	4822 121 51387	10nF	20%	16V
2454	4822 121 51387	10nF	20%	16V
2455	4822 122 33192	27pF	5%	50V
2456	4822 122 33192	27pF	5%	50V
2460	4822 124 40239	0,47µF	20%	63V
2461	4822 126 11585	22nF		50V
2462	4822 126 11585	22nF		50V
2463	4822 126 11585	22nF		50V
2464	4822 124 41525	100µF	20%	25V
2465	4822 124 22263	220µF	20%	25V
2466	4822 124 40248	10µF	20%	63V
2468	4822 124 40248	10µF	20%	63V
2469	4822 124 40242	1µF	20%	63V
2470	4822 124 40242	1µF	20%	63V
2471	4822 122 33519	470pF	10%	50V
2472	4822 122 33519	470pF	10%	50V
2473	4822 124 40433	47µF	20%	25V
2475	4822 124 22263	220µF	20%	25V
2476	4822 124 41525	100µF	20%	25V
2477	4822 124 40433	47µF	20%	25V
2483	4822 122 33197	1nF	10%	50V
2484	4822 122 33197	1nF	10%	50V
2502	4822 124 41525	100µF	20%	25V
2503	4822 124 41525	100µF	20%	25V
2504	5322 124 21643	22µF	20%	40V
2505	4822 126 11585	22nF		50V
2507	4822 126 12702	270pF	10%	50V
2510	4822 122 33848	47pF	5%	50V
2512	4822 124 40242	1µF	20%	63V
2513	4822 124 40248	10µF	20%	63V
2514	4822 126 12702	270pF	10%	50V
2552	4822 122 33197	1nF	10%	50V
2553	4822 122 33197	1nF	10%	50V
2554	4822 122 33197	1nF	10%	50V
2555	4822 122 33197	1nF	10%	50V
2556	4822 122 33195	100pF	10%	50V
2557	4822 122 33195	100pF	10%	50V
2558	5322 121 42386	100nF	5%	63V

RECORDER BOARD

DIODES

6701	4822 130 30621	1N4148
6702	4822 130 30621	1N4148
6704	4822 130 30621	1N4148
6705	4822 130 30621	1N4148
6706	4822 130 30621	1N4148
6707	4822 130 30621	1N4148
6710	4822 130 30621	1N4148
6712	4822 130 30621	1N4148

TRANSISTORS

7703	4822 130 40937	BC548B
7704	4822 130 40937	BC548B
7705	4822 130 40937	BC548B
7706	5322 130 44779	BC338-40
7707	5322 130 44779	BC338-40
7708	4822 130 44197	BC558B
7709	4822 130 40937	BC548B
7712	4822 130 44196	BC548C
7713	4822 130 44197	BC558B
7753	4822 130 40937	BC548B
7756	5322 130 44779	BC338-40
7757	5322 130 44779	BC338-40

INTEGRATED CIRCUITS

7701	4822 209 72491	KA2224
7702	4822 209 70288	UPC1313HA

COILS

5701	4822 157 51238	820µH
5702	4822 157 51238	820µH

RESISTORS

3701	4822 116 52224	470R	5%	0,5W
3702	4822 116 52224	470R	5%	0,5W
3703	4822 116 52224	470R	5%	0,5W
3704	4822 116 52258	220k	5%	0,5W
3705	4822 116 52188	27R	5%	0,5W
3706	4822 116 52175	100R	5%	0,5W
3709	4822 116 52175	100R	5%	0,5W
3710	4822 116 52289	5k6	5%	0,16W
3711	4822 116 52234	100k	5%	0,5W
3712	4822 116 52251	18k	5%	0,5W
3713	4822 116 52296	6k8	5%	0,5W
3715	4822 116 52257	22k	5%	0,5W
3716	4822 050 11002	1k	5%	0,2W
3717	4822 116 52256	2k2	5%	0,16W
3718	4822 116 52224	470R	5%	0,5W
3719	4822 116 52257	22k	5%	0,5W
3720	4822 116 52224	470R	5%	0,5W
3721	4822 116 52224	470R	5%	0,5W
3722	4822 116 52224	470R	5%	0,5W
3723	4822 116 52224	470R	5%	0,5W
3724	4822 116 52258	220k	5%	0,5W
3725	4822 116 52175	100R	5%	0,5W
3727	4822 050 22205	2M2	1%	0,6W
3730	4822 050 11002	1k	5%	0,2W
3731	4822 116 52207	1k2	5%	0,5W

RESISTORS

3732	4822 116 52233	10k	5%	0,5W
3733	4822 116 52207	1k2	5%	0,5W
3734	4822 116 52233	10k	5%	0,5W
3735	4822 116 52238	12k	5%	0,5W
3736	4822 116 52264	27k	5%	0,5W
3737	4822 116 52224	470R	5%	0,5W
3738	4822 116 52257	22k	5%	0,5W
3739	4822 116 52224	470R	5%	0,5W
3741	4822 050 11002	1k	5%	0,2W
3742	4822 050 11002	1k	5%	0,2W
3743	4822 116 52257	22k	5%	0,5W
3744	4822 116 52258	220k	5%	0,5W
3745	4822 116 52234	100k	5%	0,5W
3746	4822 116 52224	470R	5%	0,5W
3747	4822 116 52234	100k	5%	0,5W
3749	4822 116 52283	4k7	5%	0,5W
3751	4822 116 52224	470R	5%	0,5W
3752	4822 116 52224	470R	5%	0,5W
3753	4822 116 52224	470R	5%	0,5W
3754	4822 116 52258	220k	5%	0,5W
3755	4822 116 52188	27R	5%	0,5W
3756	4822 050 11002	1k	5%	0,2W
3760	4822 116 52289	5k6	5%	0,16W
3761	4822 116 52234	100k	5%	0,5W
3763	4822 116 52296	6k8	5%	0,5W
3765	4822 116 52257	22k	5%	0,5W
3766	4822 050 11002	1k	5%	0,2W
3767	4822 116 52256	2k2	5%	0,16W
3768	4822 116 52224	470R	5%	0,5W
3769	4822 116 52257	22k	5%	0,5W
3770	4822 116 52224	470R	5%	0,5W
3771	4822 116 52224	470R	5%	0,5W
3772	4822 116 52224	470R	5%	0,5W
3773	4822 116 52224	470R	5%	0,5W
3774	4822 116 52258	220k	5%	0,5W
3775	4822 116 52175	100R	5%	0,5W
3778	4822 052 10189	18R	5%	0,33W
3779	4822 116 52298	680k	5%	0,5W
3780	4822 050 11002	1k	5%	0,2W
3781	4822 116 52207	1k2	5%	0,5W
3782	4822 050 11002	1k	5%	0,2W
3783	4822 116 52258	220k	5%	0,5W
3785	4822 116 52238	12k	5%	0,5W
3786	4822 116 52264	27k	5%	0,5W
3788	4822 116 52257	22k	5%	0,5W
3789	4822 116 52224	470R	5%	0,5W
3791	4822 050 11002	1k	5%	0,2W
3792	4822 050 11002	1k	5%	0,2W
3796	4822 116 52257	22k	5%	0,5W
3797	4822 050 11002	1k	5%	0,2W
3798	4822 116 52231	820R	5%	0,5W
3799	4822 116 52234	100k	5%	0,5W

CAPACITORS

2701	4822 122 10173	820pF	10%	50V
2702	4822 122 10182	100pF	5%	50V
2703	4822 124 41643	100µF	20%	16V
2704	4822 126 11595	470pF	10%	50V
2705	4822 126 11325	4,7nF	10%	50V
2706	4822 124 40433	47µF	20%	25V
2708	4822 124 40435	10µF	20%	50V
2709	4822 121 41857	10nF	5%	250V
2711	4822 124 22633	22µF	20%	35V
2712	4822 126 11311	4,7nF		50V

CAPACITORS

2713	4822 124 40433	47µF	20%	25V
2720	4822 122 10174	1,5nF	10%	50V
2721	4822 122 33534	1,2nF	10%	50V
2722	4822 124 22466	1µF	20%	50V
2723	4822 124 22633	22µF	20%	35V
2724	4822 126 11595	470pF	10%	50V
2725	4822 124 40433	47µF	20%	25V
2726	4822 124 40433	47µF	20%	25V
2728	4822 124 40435	10µF	20%	50V
2730	4822 126 11325	4,7nF	10%	50V
2731	4822 121 41857	10nF	5%	250V
2732	4822 122 10158	1nF	10%	50V
2751	4822 122 10173	820pF	10%	50V
2753	4822 124 41643	100µF	20%	16V
2754	4822 126 11595	470pF	10%	50V
2758	4822 124 40435	10µF	20%	50V
2759	4822 121 41857	10nF	5%	250V
2762	4822 126 11311	4,7nF	50V	
2770	4822 122 10174	1,5nF	10%	50V
2771	4822 122 33534	1,2nF	10%	50V
2772	4822 124 22466	1µF	20%	50V
2773	4822 124 22633	22µF	20%	35V
2774	4822 126 11595	470pF	10%	50V
2775	4822 124 40184	1000µF	20%	10V
2778	4822 124 40435	10µF	20%	50V
2781	4822 121 41857	10nF	5%	250V
2782	4822 122 10158	1nF	10%	50V
2783	4822 121 41935	12nF	5%	250V
2784	4822 124 40242	1µF	20%	63V
2785	4822 121 51305	15nF	10%	50V
2786	4822 122 10183	100pF	5%	50V
2788	4822 124 40433	47µF	20%	25V
2789	4822 124 40433	47µF	20%	25V
2790	4822 124 40433	47µF	20%	25V
2791	4822 124 22263	220µF	20%	25V

POWER BOARD

MECHANICAL PARTS

	4822 255 40128	CLIP TO126
	5322 255 40397	CLIP IC

MISCELLANEOUS

1304	4822 267 31176	SPEAKER TERMINAL
1305	4822 264 30175	SOCKET EXT. SUPPLY

DIODES

6250	4822 130 82079	D3SBA20
6251	4822 130 30621	1N4148
6252	4822 130 30621	1N4148
6253	4822 130 34174	BZX79-C4V7
6254	4822 130 30621	1N4148
6255	5322 130 30684	1N4002
6256	5322 130 30684	1N4002
6257	5322 130 30684	1N4002
6258	5322 130 30684	1N4002
6259	4822 130 30621	1N4148
6261	5322 130 30684	1N4002
6350	4822 130 30621	1N4148
6351	4822 130 30621	1N4148
6352	4822 130 34278	BZX79-C6V8
6354	4822 130 30621	1N4148

TRANSISTORS

7250	4822 130 40937	BC548B
7252	4822 130 61236	BD234
7253	4822 130 40937	BC548B
7254	4822 130 40937	BC548B
7255	4822 130 44197	BC558B
7309	4822 130 41344	BC337-40
7310	4822 130 41344	BC337-40
7311	4822 130 41344	BC337-40
7312	4822 130 41344	BC337-40
7350	4822 130 41344	BC337-40
7351	4822 130 40937	BC548B
7352	4822 130 40937	BC548B

INTEGRATED CIRCUITS

7313	4822 209 73356	AN7161N(FP)
7314	4822 209 73356	AN7161N(FP)

COILS

5309	4822 157 62552	COIL 2,2µH
5310	4822 157 62552	COIL 2,2µH
5311	4822 157 62552	COIL 2,2µH
5312	4822 157 62552	COIL 2,2µH
5315	4822 157 62552	COIL 2,2µH
5316	4822 157 62552	COIL 2,2µH

RESISTORS

3250	4822 050 11002	1k	5%	0,2W
3251	4822 116 52233	10k	5%	0,5W
3252	4822 116 52233	10k	5%	0,5W
3254	4822 051 10333	33k	2%	0,25W
3255	4822 050 11002	1k	5%	0,2W
3256	4822 050 11002	1k	5%	0,2W
3257	4822 116 52233	10k	5%	0,5W
3258	4822 116 52283	4k7	5%	0,5W
3259	4822 051 10333	33k	2%	0,25W
3260	4822 116 52233	10k	5%	0,5W

RESISTORS

3261	4822 116 52291	56k	5%	0,5W
3262	4822 050 11002	1k	5%	0,2W
3263	4822 116 52283	4k7	5%	0,5W
3264	4822 116 52217	270R	5%	0,5W
3307	4822 116 52256	2k2	5%	0,16W
3308	4822 116 52256	2k2	5%	0,16W
3309	4822 050 11002	1k	5%	0,2W
3310	4822 050 11002	1k	5%	0,2W
3311	4822 050 11002	1k	5%	0,2W
3312	4822 050 11002	1k	5%	0,2W
3313	4822 116 52256	2k2	5%	0,16W
3314	4822 116 52256	2k2	5%	0,16W
3315	4822 116 52257	22k	5%	0,5W
3316	4822 116 52257	22k	5%	0,5W
3317	4822 116 52217	270R	5%	0,5W
3318	4822 116 52217	270R	5%	0,5W
3318	4822 116 52215	220R	5%	0,16W
3319	4822 052 10228	2R2	5%	0,33W
3320	4822 052 10228	2R2	5%	0,33W
3321	4822 052 10228	2R2	5%	0,33W
3322	4822 052 10228	2R2	5%	0,33W
3323	4822 116 52175	100R	5%	0,5W
3324	4822 116 52175	100R	5%	0,5W
3325	4822 116 52175	100R	5%	0,5W
3326	4822 116 52175	100R	5%	0,5W
3350	4822 052 10479	47R	5%	0,3W
3351	4822 116 52276	3k9	5%	0,5W
3352	4822 116 52233	10k	5%	0,5W
3353	4822 116 52233	10k	5%	0,5W
3354	4822 116 52234	100k	5%	0,5W
3355	4822 116 52217	270R	5%	0,5W

CAPACITORS

2250	5322 121 42578	100nF	10%	100V
2251	5322 121 42386	100nF	5%	63V
2252	5322 121 42386	100nF	5%	63V
2253	4822 124 42119	4700µF	20%	25V
2254	4822 124 40242	1µF	20%	63V
2255	4822 122 33197	1nF	10%	50V
2256	4822 126 11585	22nF	50V	
2257	5322 121 42578	100nF	10%	100V
2258	5322 121 42386	100nF	5%	63V
2259	5322 121 42386	100nF	5%	63V
2260	4822 124 22412	2200µF	20%	16V
2261	4822 124 40201	1000µF	20%	16V
2262	4822 124 41525	100µF	20%	25V
2265	4822 124 41994	3300µF	20%	16V
2266	4822 122 33197	1nF	10%	50V
2267	4822 122 33197	1nF	10%	50V
2311	4822 124 40242	1µF	20%	63V
2312	4822 124 40242	1µF	20%	63V
2315	5322 121 42489	33nF	5%	100V
2316	5322 121 42489	33nF	5%	100V
2317	4822 124 40242	1µF	20%	63V
2318	4822 124 40242	1µF	20%	63V
2319	4822 124 40433	47µF	20%	25V
2320	4822 124 40433	47µF	20%	25V
2321	4822 122 33169	680pF	10%	50V

CAPACITORS

2322	4822 122 33169	680pF	10%	50V
2323	5322 122 32777	1,8nF	10%	50V
2324	5322 122 32777	1,8nF	10%	50V
2325	4822 124 40196	220µF	20%	16V
2326	4822 124 40196	220µF	20%	16V
2329	5322 124 41431	22µF	20%	25V
2330	5322 124 41431	22µF	20%	25V
2333	4822 124 40433	47µF	20%	25V
2334	4822 124 40433	47µF	20%	25V
2335	4822 124 40433	47µF	20%	25V
2336	4822 124 40433	47µF	20%	25V
2337	4822 121 42408	220nF	5%	63V
2338	4822 121 42408	220nF	5%	63V
2339	4822 121 42408	220nF	5%	63V
2340	4822 121 42408	220nF	5%	63V
2350	4822 124 41525	100µF	20%	25V
2351	5322 121 42386	100nF	5%	63V
2352	5322 121 42386	100nF	5%	63V
2353	5322 121 42386	100nF	5%	63V
2354	4822 124 40242	1µF	20%	63V
2355	4822 126 12705	47pF	5%	50V
2356	4822 126 12705	47pF	5%	50V
2357	4822 124 40435	10µF	20%	50V
2361	4822 122 10177	10nF	20%	25V
2362	4822 122 10177	10nF	20%	25V

TRAFO BOARD

MISCELLANEOUS

1250	4822 071 55002	FUSE T5A
1250	4822 252 51123	FUSE T6,3A
1251	4822 071 56301	Fuse T 630mA/250V
1252	4822 071 56301	Fuse T 630mA/250V
1252	4822 253 30334	FUSE T1,25A
1255	4822 265 31015	MAINS SOCKET NOT FOR /37
1255	4822 265 31016	MAINS SOCKET ONLY FOR /37
1260	4822 272 10269	VOLTAGE SELECTOR

Values for fuses see Circuit Diagram on page 39

5250	4822 146 31239	TRAFO /20, /22
5250	4822 146 31234	TRAFO /37
5250	4822 146 31235	TRAFO AS445/21, /30
5250	4822 146 31235	TRAFO AS445/21, /30
5250	4822 146 31254	TRAFO /25

COILS

5251	4822 157 70003	COIL, MAINS FILTER

RESISTORS

3298	4822 053 21106	10M	5%	0,5W

ECO4 Tuner

MISCELLANEOUS

1101	4822 267 10283	SOCKET COAX IEC 75R
1101	4822 265 20598	F-CONNECT. COAX 75R

DIODES

6105	4822 130 83075	HN1V02H
6109	4822 130 82833	1SV228
6122	4822 130 30621	1N4148
6121	4822 130 30621	1N4148
6123	4822 130 30621	1N4148
6124	4822 130 82833	1SV228
6140	4822 130 30621	1N4148
6154	4822 130 30621	1N4148
6174	4822 130 34233	BZX79-B5V1

TRANSISTORS

7102	5322 130 42136	BC848C(CHIP)
7104	5322 130 42136	BC848C(CHIP)
7105	4822 130 60093	2SA838B
7120	4822 130 60163	2SC1047
7121	5322 130 42136	BC848C(CHIP)
7123	5322 130 42136	BC848C(CHIP)
7128	5322 130 42136	BC848C(CHIP)
7152	5322 130 41983	BC858B(CHIP)
7156	4822 130 41344	BC337-40
7157	4822 130 41344	BC337-40
7169	5322 130 41983	BC858B(CHIP)
7170	5322 130 42136	BC848C(CHIP)
7171	5322 130 42136	BC848C(CHIP)
7174	5322 130 41983	BC858B(CHIP)
7178	5322 130 41983	BC858B(CHIP)
7179	5322 130 42136	BC848C(CHIP)

INTEGRATED CIRCUITS

7140	4822 209 32011	TEA5712T/N1 (Radio-IC)
7150	5322 209 14482	HEF4069UBT (6xINVERTER)
7172	4822 209 30606	MM74HCU04M (6xINVERTER)
7173	4822 209 31998	LC7218M SYNTHESIZER

COILS

5105	4822 158 60641	Ferrite ant.,MW/LW
5106	4822 158 60642	Ferrite ant.,MW
5109	4822 156 30947	RF COIL var. 1,5 TURNS
5120	4822 156 30947	RF COIL var. 1,5 TURNS
5122	4822 157 60517	COIL var. 110µH 8%
5123	4822 157 60517	COIL var. 110µH 8%
5140	4822 158 60511	AM-IF FILTER 450kHz
5142	4822 157 70302	AM-IF FILTER 450kHz
5143	4822 242 70665	CER. FILTER 10,7MHZ
5144	4822 242 70665	CER. FILTER 10,7MHZ
5145	4822 242 81362	CER. DISCRIMINATOR
5150	4822 157 50975	1mH 10%
5170	4822 242 72976	CER.RESONATOR 7,2MHz
5171	4822 157 50963	2,2µH

RESISTORS

3119	4822 116 52224	470R	5%	0,5W
3120	4822 116 52289	5k6	5%	0,16W
3124	4822 116 52256	2k2	5%	0,16W
3132	4822 116 52283	4k7	5%	0,5W
3141	4822 116 52215	220R	5%	0,1 6W
3148	4822 100 11682	POTMETER 47k LIN.		
3151	4822 116 52243	1k5	5%	0,16W
3156	4822 116 52233	10k	5%	0,5W
3162	4822 050 11002	1k	5%	0,2W
3163	4822 050 11002	1k	5%	0,2W
3164	4822 116 52283	4k7	5%	0,5W
3165	4822 116 52283	4k7	5%	0,5W
3170	4822 116 52283	4k7	5%	0,5W
3173	4822 116 52244	15k	5%	0,5W
3174	4822 116 52233	10k	5%	0,5W
3177	4822 116 52233	10k	5%	0,5W
3181	4822 116 52234	100k	5%	0,5W
3189	4822 116 52249	1k8	5%	0,16W
3190	4822 116 52249	1k8	5%	0,16W
3191	4822 116 52249	1k8	5%	0,16W
3192	4822 116 52249	1k8	5%	0,16W
3193	4822 116 52224	470R	5%	0,5W
3194	4822 050 24701	470R	5%	
3195	4822 050 24701	470R	5%	
3197	4822 050 24701	470R	5%	

CHIP RESISTORS

3106	4822 051 20104	100k	5%	0,1W
3107	4822 051 20222	2k2	5%	0,1W
3108	4822 051 20104	100k	5%	0,1W
3109	4822 051 20222	2k2	5%	0,1W
3110	4822 051 20473	47k	5%	0,1W
3111	4822 051 20153	15k	5%	0,1W
3112	4822 051 20223	22k	5%	0,1W
3116	4822 051 20335	3M3	5%	0,1W
3121	4822 051 20104	100k	5%	0,1W
3122	4822 051 20471	470R	5%	0,1W
3123	4822 051 20223	22k	5%	0,1W
3125	4822 051 20472	4k7	5%	0,1W
3128	4822 051 20222	2k2	5%	0,1W
3129	4822 051 20472	4k7	5%	0,1W
3142	4822 051 20222	2k2	5%	0,1W
3144	4822 051 20473	47k	5%	0,1W
3147	4822 051 20184	180k	5%	0,1W
3149	4822 051 20683	68k	5%	0,1W
3154	4822 051 20333	33k	5%	0,1W
3155	4822 051 20333	33k	5%	0,1W
3157	4822 051 20473	47k	5%	0,1W
3158	4822 051 20189	18R	5%	0,1W
3160	4822 051 20823	82k	5%	0,1W
3161	4822 051 20823	82k	5%	0,1W
3166	4822 051 20101	100R	5%	0,1W
3167	4822 051 20008	CHIP JUMPER 0805		
3171	4822 051 20101	100R	5%	0,1W
3172	4822 051 20472	4k7	5%	0,1W
3175	4822 051 20104	100k	5%	0,1W
3176	4822 051 20104	100k	5%	0,1W
3178	4822 051 20104	100k	5%	0,1W
3179	4822 051 20223	22k	5%	0,1W
3180	4822 051 20104	100k	5%	0,1W
3183	4822 051 20223	22k	5%	0,1W
3184	4822 051 20223	22k	5%	0,1W

CHIP RESISTORS

3185	4822 051 20104	100k	5%	0,1W
3186	4822 051 20104	100k	5%	0,1W
3188	4822 051 10102	1k	2%	0,25W
3211	4822 051 10008	CHIP JUMPER 1206		
3212	4822 051 10008	CHIP JUMPER 1206		
3213	4822 051 10008	CHIP JUMPER 1206		
3220	4822 051 20008	CHIP JUMPER 0805		
3222	4822 051 20008	CHIP JUMPER 0805		
3222	4822 051 20008	CHIP JUMPER 0805		
3223	4822 051 20008	CHIP JUMPER 0805		
3224	4822 051 20008	CHIP JUMPER 0805		
3226	4822 051 20008	CHIP JUMPER 0805		
3226	4822 051 20008	CHIP JUMPER 0805		
3228	4822 051 10008	CHIP JUMPER 1206		
3229	4822 051 20008	CHIP JUMPER 0805		
3229	4822 051 20008	CHIP JUMPER 0805		
3233	4822 051 20008	CHIP JUMPER 0805		
3237	4822 051 10008	CHIP JUMPER 1206		
3238	4822 051 20008	CHIP JUMPER 0805		
3240	4822 051 10008	CHIP JUMPER 1206		
3241	4822 051 20008	CHIP JUMPER 0805		
3241	4822 051 20008	CHIP JUMPER 0805		
3242	4822 051 10008	CHIP JUMPER 1206		
3243	4822 051 20008	CHIP JUMPER 0805		
3243	4822 051 20008	CHIP JUMPER 0805		
3244	4822 051 20008	CHIP JUMPER 0805		
3245	4822 051 20008	CHIP JUMPER 0805		
3245	4822 051 20008	CHIP JUMPER 0805		
3246	4822 051 10008	CHIP JUMPER 1206		
3247	4822 051 10008	CHIP JUMPER 1206		
3248	4822 051 20008	CHIP JUMPER 0805		
3249	4822 051 20153	15k	5%	0,1W
3249	4822 051 20821	820R	5%	0,1W
3249	4822 051 20821	820R	5%	0,1W

CAPACITORS

2100	4822 122 33195	100pF	10%	50V
2104	4822 122 33195	100pF	10%	50V
2107	4822 122 31746	1nF	5%	50V
2115	4822 125 60101	10pF VARIABLE		
2122	4822 122 31746	1nF	5%	50V
2123	4822 122 31746	1nF	5%	50V
2124	4822 121 51387	10nF	20%	16V
2129	4822 121 43705	390pF	1%	160V
2130	4822 125 50355	4,2 - 20pF VARIABLE		
2134	4822 122 33197	1nF	10%	50V
2135	4822 121 70245	560pF	1%	160V
2141	4822 124 40244	2,2µF	20%	63V
2142	4822 124 40242	1µF	20%	63V
2150	4822 124 40435	10µF	20%	50V
2151	4822 124 40435	10µF	20%	50V
2156	5322 126 10181	100nF		25V
2157	5322 126 10181	100nF		25V
2158	4822 122 31746	1nF	5%	50V
2159	4822 122 31746	1nF	5%	50V
2160	4822 124 40242	1µF	20%	63V
2161	4822 124 40242	1µF	20%	63V
2162	4822 124 40242	1µF	20%	63V
2172	4822 124 41631	1,5µF	20%	50V
2173	4822 124 40433	47µF	20%	25V
2177	5322 126 10181	100nF		25V

CAPACITORS

2178	4822 122 33197	1nF	10%	50V
2179	4822 122 33195	100pF	10%	50V
2184	4822 124 41584	100µF	20%	10V
2186	4822 122 31746	1nF	5%	50V

CHIP CAPACITORS

2110	5322 122 32659	33pF	5%	50V
2110	5322 122 32269	6,8pF	5%	50V
2110	5322 122 32269	6,8pF	5%	50V
2112	4822 122 33496	100nF	10%	63V
2114	5322 122 32531	100pF	5%	50V
2120	5322 122 32268	470pF	10%	50V
2121	5322 122 32481	15pF	5%	50V
2133	4822 122 33177	10nF	20%	50V
2138	5322 122 32658	22pF	5%	50V
2138	5322 122 32658	22pF	5%	50V
2139	4822 122 32627	2,2nF	10%	50V
2143	4822 122 33325	470nF	20%	50V
2144	4822 122 33325	470nF	20%	50V
2145	4822 122 33496	100nF	10%	63V
2146	5322 122 33063	2,2pF	10%	50V
2147	4822 122 33177	10nF	20%	50V
2152	4822 122 33496	100nF	10%	63V
2154	4822 122 33175	2,2nF	20%	50V
2155	4822 122 33175	2,2nF	20%	50V
2158	4822 122 31775	680pF	5%	50V
2159	4822 122 31775	680pF	5%	50V
2168	4822 122 33481	1,8nF	5%	NP0
2169	5322 122 31863	330pF	5%	50V
2170	5322 126 10223	4,7nF	10%	63V
2171	5322 126 10223	4,7nF	10%	63V
2174	5322 116 80853	560pF	5%	63V
2175	5322 122 32531	100pF	5%	50V
2180	5322 122 31946	27pF	5%	50V
2181	4822 122 32139	12pF	5%	63V
2183	4822 122 33496	100nF	10%	63V
2185	4822 122 33496	100nF	10%	63V

TUNER 92

MISCELLANEOUS

1101	4822 210 10492	FRONTEND ASSY /02/08
1110	4822 267 10283	SOCKET COAX IEC 75R

DIODES

6101	4822 130 34174	BZX79-C4V7
6102	4822 130 83075	HN1V02H
6109	4822 130 30621	1N4148

TRANSISTORS

7101	4822 130 60163	2SC1047
7104	5322 130 60068	BC558C
7106	5322 130 60068	BC558C
7107	5322 130 41982	BC848 (CHIP)
7108	4822 130 44196	BC548C
7109	4822 130 44196	BC548C
7111	5322 130 41982	BC848 (CHIP)
7112	4822 130 60163	2SC1047
7113	4822 130 44196	BC548C
7114	4822 130 40937	BC548B
7115	4822 130 41024	BF245B
7116	4822 130 60163	2SC1047
7119	5322 130 41983	BC858B(CHIP)
7120	4822 130 44196	BC548C
7150	5322 130 44779	BC338-40
7151	4822 130 60163	2SC1047
7157	5322 130 44779	BC338-40

INTEGRATED CIRCUITS

7103	4822 209 31001	LA1851N
7105	4822 209 30178	LC7218

COILS

5101	4822 157 53192	0,22µH
5103	4822 242 81249	CER. FILTER 10,7MHz
5104	4822 157 63029	AM IF COIL
5105	4822 157 63904	Q-DETECION COIL
5106	4822 157 63802	BIRDY FILTER
5108	4822 157 63912	OSC.COIL AM 3-BAND
5110	4822 242 71878	CERAM.RES. 450kHz
5111	4822 242 81248	CER. FILTER 10,7MHz
5112	4822 242 72976	CER.RESONATOR 7,2MHz
5113	4822 242 81249	CER. FILTER 10,7MHz
5114	4822 152 20699	560µH
5127	4822 158 60643	FERROCEPTOR

RESISTORS

3101	4822 052 10478	4R7	5%	NFR
3108	4822 116 52224	470R	5%	0,5W
3113	4822 050 22201	220R	2%	0,25W
3118	4822 050 22201	220R	2%	0,25W
3120	4822 052 10229	22R	5%	0,33W
3125	4822 100 11213	22k	30%	POT.
3131	4822 100 11319	4k7 trimpot.		
3134	4822 050 15602	5k6	1%	0,4W
3138	4822 116 83922	150R	5%	1W
3147	4822 050 15602	5k6	1%	0,4W
3150	4822 050 25601	560R	1%	0,6W
3151	4822 050 24702	4k7	1%	0,6W
3155	4822 050 22201	220R	2%	0,25W
3158	4822 050 24702	4k7	1%	0,6W
3162	4822 050 22701	270R	1%	0,6W

RESISTORS

3165	4822 050 21002	1k	1%	0,6W
3166	4822 050 21002	1k	1%	0,6W
3167	4822 050 21002	1k	1%	0,6W
3183	4822 050 21003	10k	2%	0,25W
3186	4822 050 21003	10k	2%	0,25W
3225	4822 050 21002	1k	1%	0,6W
3244	5322 116 44005	250R	25%	

CHIP RESISTORS

3102	4822 051 20224	220k	5%	0,1W
3104	4822 051 20154	150k	5%	0,1W
3105	4822 051 20562	5k6	5%	0,1W
3106	4822 051 20829	82R	5%	0,1W
3107	4822 051 20104	100k	5%	0,1W
3114	4822 051 20332	3k3	5%	0,1W
3115	4822 051 20391	390R	5%	0,1W
3116	4822 051 20478	4R7	5%	0,1W
3117	4822 051 20331	330R	5%	0,1W
3121	4822 051 20272	2k7	5%	0,1W
3122	4822 051 20562	5k6	5%	0,1W
3123	4822 051 20223	22k	5%	0,1W
3124	4822 051 20103	10k	5%	0,1W
3126	4822 051 20123	12k	2%	0,1W
3127	4822 051 20562	5k6	5%	0,1W
3129	4822 051 20103	10k	5%	0,1W
3132	4822 051 20183	18k	5%	0,1W
3133	4822 051 20008	CHIP JUMPER 0805		
3135	4822 051 10008	CHIP JUMPER 1206		
3141	4822 051 20472	4k7	5%	0,1W
3142	4822 051 20472	4k7	5%	0,1W
3143	4822 051 20821	820R	5%	0,1W
3144	4822 051 20331	330R	5%	0,1W
3145	4822 051 20271	270R	5%	0,1W
3148	4822 051 20104	100k	5%	0,1W
3149	4822 051 20472	4k7	5%	0,1W
3152	4822 051 20103	10k	5%	0,1W
3153	4822 051 20274	270k	5%	0,1W
3156	4822 051 20153	15k	5%	0,1W
3157	4822 051 20472	4k7	5%	0,1W
3159	4822 051 20104	100k	5%	0,1W
3160	4822 051 20104	100k	5%	0,1W
3163	4822 051 20103	10k	5%	0,1W
3164	4822 051 20473	47k	5%	0,1W
3170	4822 051 20103	10k	5%	0,1W
3171	4822 051 20223	22k	5%	0,1W
3172	4822 051 20472	4k7	5%	0,1W
3173	4822 051 20223	22k	5%	0,1W
3184	4822 051 20332	3k3	5%	0,1W
3185	4822 051 20103	10k	5%	0,1W
3187	4822 051 20103	10k	5%	0,1W
3190	4822 051 20479	47R	5%	0,1W
3194	4822 051 20472	4k7	5%	0,1W
3196	4822 051 20008	CHIP JUMPER 0805		
3197	4822 051 20008	CHIP JUMPER 0805		
3198	4822 051 20103	10k	5%	0,1W
3200	4822 051 20008	CHIP JUMPER 0805		
3201	4822 051 20103	10k	5%	0,1W
3202	4822 051 20008	CHIP JUMPER 0805		
3223	4822 051 20474	470k	5%	0,1W

CHIP RESISTORS

3230	4822 051 20223	22k	5%	0,1W
3231	4822 051 20223	22k	5%	0,1W
3233	4822 051 10102	1k	2%	0,25W
3236	4822 051 20008	CHIP JUMPER 0805		
3239	4822 051 20274	270k	5%	0,1W
3240	4822 051 20472	4k7	5%	0,1W

CAPACITORS

2103	4822 124 40433	47µF	20%	25V
2104	4822 121 42408	220nF	5%	63V
2107	4822 122 31385	22pF	5%	50V
2114	5322 124 41431	22µF	20%	25V
2115	4822 124 40239	0,47µF	20%	63V
2116	5322 121 42386	100nF	5%	63V
2117	4822 121 41935	12nF	5%	250V
2118	4822 121 41935	12nF	5%	250V
2119	4822 124 40244	2,2µF	20%	63V
2120	4822 124 40244	2,2µF	20%	63V
2121	4822 124 40196	220µF	20%	16V
2123	4822 124 40246	4,7uF	20%	63V
2124	4822 124 40246	4,7uF	20%	63V
2129	4822 124 40242	1µF	20%	63V
2131	4822 124 40435	10µF	20%	50V
2142	4822 125 60102	30pF VARIABLE		
2144	4822 121 42408	220nF	5%	63V
2145	4822 121 51263	510pF	1%	400V
2146	4822 121 70082	430pF	1%	400V
2152	4822 124 40242	1µF	20%	63V
2156	4822 124 40433	47µF	20%	25V
2160	4822 124 41631	1,5µF	20%	50V
2162	4822 122 10166	22nF	30%	16V
2165	4822 124 40433	47µF	20%	25V
2193	4822 125 60102	30pF VARIABLE		
2194	4822 125 60101	10pF VARIABLE		
2210	4822 124 41643	100µF	20%	16V

CHIP CAPACITORS

2101	5322 122 34099	470pF	10%	63V
2102	5322 122 32268	470pF	10%	50V
2105	5322 122 32965	18pF	5%	50V
2108	5322 122 32654	22nF	10%	63V
2109	5322 122 32654	22nF	10%	63V
2110	5322 122 32654	22nF	10%	63V
2112	5322 122 32654	22nF	10%	63V
2113	5322 122 32661	56pF	5%	50V
2125	4822 122 33177	10nF	20%	50V
2126	4822 122 31782	15nF	10%	50V
2147	5322 122 32654	22nF	10%	63V
2148	5322 122 32452	47pF	5%	50V
2149	4822 122 33177	10nF	20%	50V
2150	5322 122 32654	22nF	10%	63V
2151	5322 122 34099	470pF	10%	63V
2153	5322 122 34099	470pF	10%	63V
2154	5322 122 32481	15pF	5%	50V
2155	5322 122 32965	18pF	5%	50V
2158	5322 126 10223	4,7nF	10%	63V
2159	5322 126 10223	4,7nF	10%	63V
2161	4822 122 32927	220nF	10%	63V
2195	4822 126 10004	120pF	5%	63V
2196	5322 122 32448	10pF	5%	50V
2215	5322 122 32268	470pF	10%	50V
2216	5322 122 32268	470pF	10%	50V

CHIP CAPACITORS

2219	4822 122 32927	220nF	10%	63V
2221	5322 122 32268	470pF	10%	50V
2224	4822 122 33575	220pF	5%	50V
2225	4822 122 33575	220pF	5%	50V

CD BOARD

MISCELLANEOUS

1020	4822 071 51601	FUSE 160mA
1021	4822 071 51601	FUSE 160mA
1250	4822 267 30933	SOCKET CHINCH

DIODES

6103	4822 130 30621	1N4148
6550	4822 130 31981	BZX79-C3V9
6660	4822 130 34173	BZX79-C5V6

TRANSISTORS

7040	4822 130 60887	BF840
7041	5322 130 41982	BC848 (CHIP)
7042	5322 130 41983	BC858B(CHIP)
7043	5322 130 41982	BC848 (CHIP)
7044	5322 130 41982	BC848 (CHIP)
7140	5322 130 42012	BC858 (CHIP)
7141	4822 130 61207	BC848 (CHIP)
7360	4822 130 42804	BC817-25 (CHIP)
7361	4822 130 42804	BC817-25 (CHIP)
7362	5322 130 42012	BC858 (CHIP)
7550	5322 130 42012	BC858 (CHIP)

INTEGRATED CIRCUITS

7000	4822 209 31064	TDA1301T/N1
7060	4822 209 72587	TCA372DP2
7080	4822 209 72587	TCA372DP2
7101	4822 209 63925	FCB61C65L-70T
7102	4822 209 30388	SAA7341GP
7300	4822 209 83274	NJM4560D
7301	4822 209 83274	NJM4560D
7500	4822 209 80891	MC7805CT
7660	4822 209 72587	TCA372DP2
7700	4822 900 10318	MC68HC05C8/SERVO-S17

COILS

1002	4822 242 73557	CERAMIC RES. 8,46MHz
1570	4822 242 81151	X-TAL 16,934MHz
1700	4822 242 72527	CERAMIC RES. 4.0 MHz
5250	4822 148 80281	COIL 100µH

RESISTORS

3000	4822 050 21003	10k	2%	0,25W
3001	4822 050 21003	10k	2%	0,25W
3002	4822 050 21003	10k	2%	0,25W
3003	4822 050 21003	10k	2%	0,25W
3004	4822 050 21003	10k	2%	0,25W
3005	4822 050 21003	10k	2%	0,25W
3007	4822 052 10338	3R3	NFR25	
3008	4822 052 10338	3R3	NFR25	
3014	4822 052 10478	4R7	5%	NFR
3015	4822 050 21002	1k	1%	0,6W
3016	4822 050 21002	1k	1%	0,6W
3049	4822 050 24301	430R	1%	0,6W
3056	4822 050 21204	120k	1%	0,6W
3057	4822 050 25603	56k	1%	0,6W
3058	4822 050 21002	1k	1%	0,6W
3062	4822 116 52244	15k	5%	0,5W
3064	4822 050 21503	15k	1%	0,6W
3065	4822 052 10229	22R	5%	0,33W
3066	4822 052 10108	1R	5%	0,33W
3067	4822 052 10108	1R	5%	0,33W

RESISTORS

3072	4822 050 26802	6k8	1%	0,6W
3073	4822 052 10229	22R	5%	0,33W
3074	4822 116 52244	15k	5%	0,5W
3075	4822 050 21003	10k	2%	0,25W
3081	4822 050 24702	4k7	1%	0,6W
3083	4822 052 10108	1R	5%	0,33W
3084	4822 052 10108	1R	5%	0,33W
3085	4822 050 21003	10k	2%	0,25W
3086	4822 052 10229	22R	5%	0,33W
3087	4822 116 52244	15k	5%	0,5W
3100	4822 050 22202	2k2	1%	0,6W
3103	4822 052 10338	3R3	NFR25	
3105	4822 052 10338	3R3	NFR25	
3111	4822 052 10229	22R	5%	0,33W
3112	4822 050 22205	2M2	1%	0,6W
3140	4822 116 52234	100k	5%	0,5W
3142	4822 050 24703	47k	1%	0,6W
3143	4822 052 10229	22R	5%	0,33W
3146	4822 050 21003	10k	2%	0,25W
3305	4822 052 10229	22R	5%	0,33W
3306	4822 052 10229	22R	5%	0,33W
3312	4822 050 22203	22k	1%	0,6W
3314	4822 050 21002	1k	1%	0,6W
3315	4822 050 21002	1k	1%	0,6W
3501	4822 052 10108	1R	5%	0,33W
3502	4822 052 10108	1R	5%	0,33W
3611	4822 116 52303	8k2	5%	0,5W
3615	4822 052 10108	1R	5%	0,33W
3616	4822 052 10108	1R	5%	0,33W
3617	4822 052 10229	22R	5%	0,33W
3701	4822 052 10338	3R3	NFR25	

CHIP RESISTORS

3006	4822 051 20103	10k	5%	0,1W
3009	4822 051 20105	1M	5%	0,1W
3010	4822 051 20103	10k	5%	0,1W
3011	4822 051 20103	10k	5%	0,1W
3012	4822 051 10102	1k	2%	0,25W
3013	4822 051 10102	1k	2%	0,25W
3017	4822 051 10102	1k	2%	0,25W
3040	4822 051 10101	100R	5%	0,125W
3041	4822 051 20393	39k	5%	0,1W
3042	4822 051 20334	330k	5%	0,1W
3043	4822 051 20303	30k	5%	0,1W
3044	4822 051 10102	1k	2%	0,25W
3045	4822 051 20101	100R	5%	0,1W
3046	4822 051 10102	1k	2%	0,25W
3047	4822 051 20434	430k	5%	0,1W
3048	4822 051 20101	100R	5%	0,1W
3050	4822 051 20434	430k	5%	0,1W
3051	4822 051 20182	1k8	5%	0,1W
3052	4822 051 20182	1k8	5%	0,1W
3053	4822 051 20392	3k9	5%	0,1W
3054	4822 051 20101	100R	5%	0,1W
3055	4822 051 20124	120k	5%	0,1W
3060	4822 117 10036	7k5	1%	0,1W
3061	4822 051 20682	6k8	5%	0,1W
3063	4822 051 20103	10k	5%	0,1W

CHIP RESISTORS

3070	4822 051 20153	15k	5%	0,1W
3071	4822 051 20103	10k	5%	0,1W
3080	4822 051 20682	6k8	5%	0,1W
3082	4822 051 20153	15k	5%	0,1W
3101	4822 051 20223	22k	5%	0,1W
3102	4822 051 20223	22k	5%	0,1W
3106	4822 051 10102	1k	2%	0,25W
3109	4822 051 20222	2k2	5%	0,1W
3110	4822 051 20105	1M	5%	0,1W
3117	4822 051 20182	1k8	5%	0,1W
3118	4822 051 20182	1k8	5%	0,1W
3119	4822 051 10561	560R	2%	0,25W
3141	4822 051 20104	100k	5%	0,1W
3144	4822 051 20223	22k	5%	0,1W
3147	4822 051 20392	3k9	5%	0,1W
3148	4822 051 20473	47k	5%	0,1W
3255	4822 051 10561	560R	2%	0,25W
3256	4822 051 20621	620R	5%	0,1W
3300	4822 051 20104	100k	5%	0,1W
3301	4822 051 20273	27k	5%	0,1W
3302	4822 051 20332	3k3	5%	0,1W
3303	4822 051 20123	12k	2%	0,1W
3304	4822 051 20123	12k	2%	0,1W
3307	4822 051 20332	3k3	5%	0,1W
3308	4822 051 20123	12k	2%	0,1W
3309	4822 051 20104	100k	5%	0,1W
3310	4822 051 20273	27k	5%	0,1W
3311	4822 051 20123	12k	2%	0,1W
3313	4822 051 20223	22k	5%	0,1W
3320	4822 116 83933	15k	1%	0,1W
3321	4822 116 83933	15k	1%	0,1W
3322	4822 116 83933	15k	1%	0,1W
3323	4822 116 83933	15k	1%	0,1W
3325	4822 116 83933	15k	1%	0,1W
3326	4822 116 83933	15k	1%	0,1W
3327	4822 116 83933	15k	1%	0,1W
3328	4822 116 83933	15k	1%	0,1W
3360	4822 051 10102	1k	2%	0,25W
3361	4822 051 10102	1k	2%	0,25W
3550	4822 051 20561	560R	5%	0,1W
3551	4822 051 10102	1k	2%	0,25W
3552	4822 051 20223	22k	5%	0,1W
3553	4822 051 10102	1k	2%	0,25W
3610	4822 051 20123	12k	2%	0,1W
3612	4822 051 20123	12k	2%	0,1W
3613	4822 051 20123	12k	2%	0,1W
3614	4822 051 20123	12k	2%	0,1W
3662	4822 051 20103	10k	5%	0,1W
3663	4822 051 20103	10k	5%	0,1W
3664	4822 051 20103	10k	5%	0,1W
3665	4822 051 20561	560R	5%	0,1W
3700	4822 051 20224	220k	5%	0,1W
3706	4822 051 20103	10k	5%	0,1W
3707	4822 051 20103	10k	5%	0,1W
3708	4822 051 20103	10k	5%	0,1W
3710	4822 051 20103	10k	5%	0,1W
3711	4822 051 20332	3k3	5%	0,1W
3713	4822 051 20103	10k	5%	0,1W
3714	4822 051 20103	10k	5%	0,1W
3715	4822 051 20332	3k3	5%	0,1W
3716	4822 051 20103	10k	5%	0,1W
3717	4822 051 20103	10k	5%	0,1W
3718	4822 051 20103	10k	5%	0,1W
3719	4822 051 20103	10k	5%	0,1W
3720	4822 051 20103	10k	5%	0,1W

CHIP RESISTORS

3721	4822 051 20103	10k	5%	0,1W
3722	4822 051 10102	1k	2%	0,25W
3723	4822 051 10102	1k	2%	0,25W
3724	4822 051 10102	1k	2%	0,25W
4000	4822 051 10008	CHIP JUMPER 1206		
4001	4822 051 10008	CHIP JUMPER 1206		
4002	4822 051 10008	CHIP JUMPER 1206		
4003	4822 051 10008	CHIP JUMPER 1206		
4004	4822 051 10008	CHIP JUMPER 1206		
4104	4822 051 10008	CHIP JUMPER 1206		
4105	4822 051 10008	CHIP JUMPER 1206		
4106	4822 051 10008	CHIP JUMPER 1206		
4107	4822 051 10008	CHIP JUMPER 1206		
4108	4822 051 10008	CHIP JUMPER 1206		
4109	4822 051 10008	CHIP JUMPER 1206		
4200	4822 051 10008	CHIP JUMPER 1206		
4302	4822 051 10008	CHIP JUMPER 1206		
4600	4822 051 10008	CHIP JUMPER 1206		
4700	4822 051 10008	CHIP JUMPER 1206		
4701	4822 051 10008	CHIP JUMPER 1206		

CAPACITORS

2010	5322 124 21643	22µF	20%	40V
2012	4822 124 40272	33µF	20%	16V
2015	5322 124 21643	22µF	20%	40V
2017	5322 124 21643	22µF	20%	40V
2042	5322 124 21643	22µF	20%	40V
2052	5322 124 21643	22µF	20%	40V
2062	4822 124 40272	33µF	20%	16V
2063	4822 124 40272	33µF	20%	16V
2081	5322 124 21643	22µF	20%	40V
2083	5322 124 21643	22µF	20%	40V
2103	4822 124 40849	330µF	20%	16V
2105	5322 121 42661	330nF	5%	63V
2107	4822 124 41584	100µF	20%	10V
2109	4822 124 40242	1µF	20%	63V
2111	5322 121 42386	100nF	5%	63V
2116	4822 124 40242	1µF	20%	63V
2119	4822 124 41584	100µF	20%	10V
2122	4822 124 40849	330µF	20%	16V
2301	4822 124 40272	33µF	20%	16V
2302	4822 124 40246	4,7uF	20%	63V
2304	4822 124 40272	33µF	20%	16V
2305	4822 124 40246	4,7uF	20%	63V
2311	4822 124 40246	4,7uF	20%	63V
2500	4822 124 80148	2200µF	20%	16V
2502	4822 124 41853	1000µF	20%	16V
2702	4822 124 40272	33µF	20%	16V

CHIP CAPACITORS

2000	5322 122 31865	1,5nF	10%	63V
2001	5322 116 80853	560pF	5%	63V
2003	4822 122 32575	220pF	10%	500V
2004	4822 122 32575	220pF	10%	500V
2005	4822 122 32575	220pF	10%	500V
2006	4822 122 32575	220pF	10%	500V
2007	4822 122 32575	220pF	10%	500V
2008	4822 122 32575	220pF	10%	500V
2009	4822 122 33496	100nF	10%	63V
2011	4822 122 33496	100nF	10%	63V
2016	4822 122 33496	100nF	10%	63V
2018	4822 122 33496	100nF	10%	63V
2019	4822 122 33809	22nF	20%	
2040	5322 122 32654	22nF	10%	63V
2041	4822 126 10326	180pF	5%	

CHIP CAPACITORS

2043	5322 122 31863	330pF	5%	50V
2044	4822 126 10326	180pF	5%	
2045	5322 122 32452	47pF	5%	50V
2046	5322 122 32452	47pF	5%	50V
2047	5322 122 32531	100pF	5%	50V
2048	5322 122 32965	18pF	5%	50V
2049	4822 126 10326	180pF	5%	
2050	4822 126 10326	180pF	5%	
2051	5322 122 31863	330pF	5%	50V
2060	4822 122 33496	100nF	10%	63V
2061	4822 122 33496	100nF	10%	63V
2064	4822 122 33342	33nF	10%	63V
2065	4822 122 33496	100nF	10%	63V
2066	4822 122 33175	2,2nF	20%	50V
2070	4822 122 33176	2,7nF	20%	50V
2071	4822 122 33496	100nF	10%	63V
2072	4822 126 10326	180pF	5%	
2080	4822 122 33496	100nF	10%	63V
2082	4822 122 33496	100nF	10%	63V
2084	4822 126 10326	180pF	5%	
2085	4822 122 33496	100nF	10%	63V
2086	5322 126 10465	3,9nF	10%	63V
2101	5322 122 32452	47pF	5%	50V
2102	4822 122 33175	2,2nF	20%	50V
2104	4822 122 33496	100nF	10%	63V
2106	4822 122 33496	100nF	10%	63V
2108	4822 122 33809	22nF	20%	
2110	5322 122 32659	33pF	5%	50V
2112	4822 122 33496	100nF	10%	63V
2114	5322 122 32452	47pF	5%	50V
2115	5322 122 32452	47pF	5%	50V
2117	5322 126 10223	4,7nF	10%	63V
2118	5322 126 10223	4,7nF	10%	63V
2120	4822 122 33496	100nF	10%	63V
2121	4822 122 33496	100nF	10%	63V
2123	4822 122 33496	100nF	10%	63V
2125	5322 126 10223	4,7nF	10%	63V
2140	4822 122 33496	100nF	10%	63V
2141	4822 122 32542	47nF	10%	63V
2253	4822 122 33105	56nF	10%	63V
2300	5322 116 80853	560pF	5%	63V
2303	4822 122 33216	270pF	5%	50V
2306	4822 122 33496	100nF	10%	63V
2309	4822 122 33216	270pF	5%	50V
2310	5322 116 80853	560pF	5%	63V
2312	4822 122 33219	1,8nF	10%	50V
2313	4822 122 33219	1,8nF	10%	50V
2501	4822 122 33496	100nF	10%	63V
2503	4822 122 33496	100nF	10%	63V
2504	4822 122 33496	100nF	10%	63V
2550	4822 122 33175	2,2nF	20%	50V
2610	4822 122 33496	100nF	10%	63V
2611	4822 122 33496	100nF	10%	63V
2612	4822 122 33496	100nF	10%	63V
2703	4822 122 33809	22nF	20%	
2704	4822 122 33175	2,2nF	20%	50V

ACCESSORIES

4822 321 10831	AC CORD /20, /21, /22
4822 321 10918	AC CORD /25
4822 321 10954	AC CORD /30
4822 321 10883	AC CORD /37
4822 218 10513	IR REMOTE CONTROL
4822 445 10359	SPEAKER /20,/22,/25
4822 445 10361	SPEAKER/37
4822 445 10362	SPEAKER/21
4822 321 10831	SPEAKER/30

4730

AS440, AS445

A93-365

Service
Service
Service

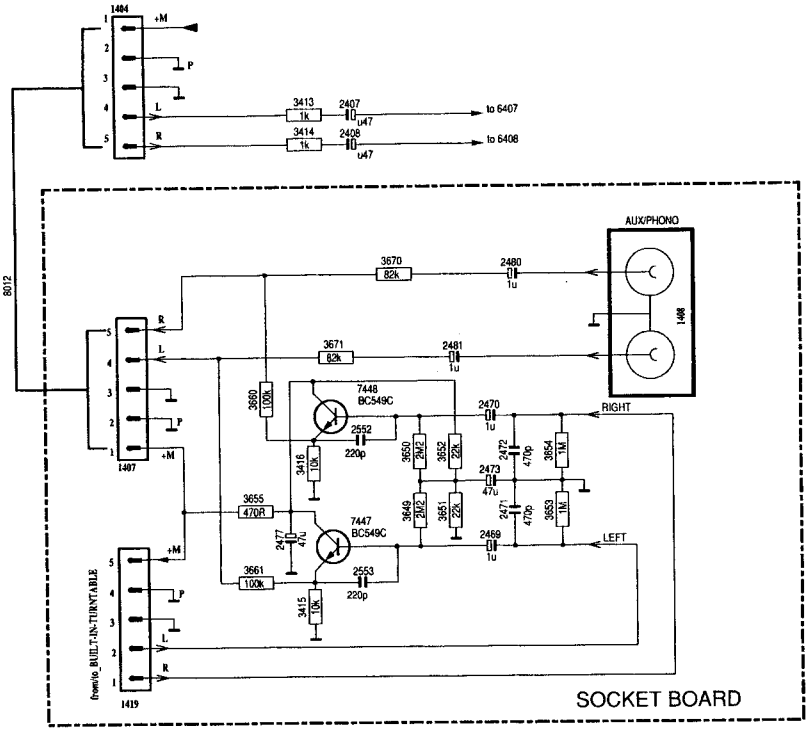
Product Service Group CE Audio

Service Information

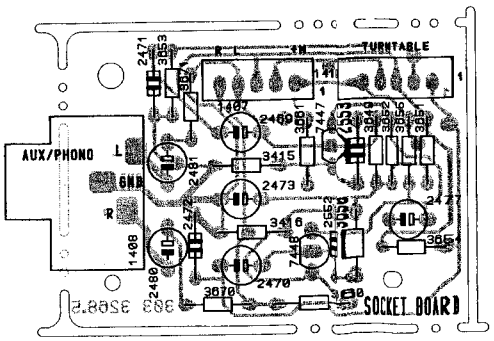
Already published Service Informations: *A93-358 (4822 725 24906)*

Fault: Playback of a record isn´t possible if an external source is connected to the AUX/PHONO socket (1408). **Only valid for sets with internal record player.**

Therefore the circuit diagram and the component layout have been changed from production week 9344 onwards.



Component side view



Capacitors 2480 and 2481(1µF) have been added. Service code **4822 124 40242**.
Resistors 3413 and 3414 have been changed to 1kΩ. Service code **4822 050 11002**.
Resistors 3660 and 3661 have been changed to 100kΩ. Service code **4822 116 52234**.
Resistors 3670 and 3671(82kΩ) have been added. Service code **4822 116 52304**.

1993-11-11

GB 4822 725 24917

CS 51 860

Sup

AS440

A93-358

Service
Service
Service

Product Service Group CE Audio

Service Information

New sets have been introduced!

For Service the set

AS440/20H is equal to **AS440/20** but different production center.
AS440/22H is equal to **AS440/22** but different production center.
AS440/25H is equal to **AS440/25** but different production center.

1993-06-17

GB 822 725 24906

Sygal.

Survey of changes - ECO 4 tuner board

Introduction date	Change					Service Code	Reason
Wk 9333	3148	from	47k	to	100k	4822 100 11163	to ease VCO adjustment
	3149	from	68k	to	56k	4822 051 20563	
	3186	from	47k	to	100k	-	increase of search sensitivity (back to normal level)
	3112	from	27k	to	22k	-	reduction of distortion in STEREO mode
Wk 9328	3112	from	22k	to	24k	-	to adapt STEREO switching level
Wk 9329	7140	from	TEA5712T/**N1**	to	TEA5712T/**N2**		
	pcb	from stage **.3**		to stage **.4**			adaptions for TEA5712T/**N2**
	3112	from	24k	to	22k	4822 051 20223	
	3157	from	47k	to	27k	4822 051 20273	
	3159	from	10k	to	180k	4822 051 20184	
	2193	100nF added				4822 122 33496	"search sensitivity circuit" changed
	3178	from	100k	to	3k3	4822 051 20332	because of TEA5712T/**N2**
	3179	from	22k	to	27k	-	
	3185	from	100k	to	4k7	4822 051 20472	
	3186	from	100k	to	18k	4822 051 20183	
	3200	22k added				4822 051 20223	
	3235	chip jumper 1206 added				4822 051 90010	
	7169	from	BC858B	to	BC848C	5822 130 42136	
Wk 9335	2154	from	2n2	to	10n	4822 122 33177	reduction of total harmonic distortion
				(USA /17)	15n	4822 122 33128	
	2155	from	2n2	to	10n	4822 122 33177	
				(USA /17)	15n	4822 122 33128	
	2158	from	1n	to	180p	4822 122 31768	
		(USA/17)	680p	to	180p	4822 122 31768	
	2159	from	1n	to	180p	4822 122 31768	
		(USA/17)	680p	to	180p	4822 122 31768	
	5171	coil changed to resistor 3198, 10R					improve S/N on LW1 53kHz
Wk 9334	3179	from	27k	to	100k	4822 051 20104	to increase FM search sensitivity
Wk 9350	cancellation of MUTE circuit						
Wk 9348	2133	from	10n	to	15n	4822 122 33128	to improve PLL behaviour when
	2138	from	22p	to	33p	4822 122 32659	jumping the whole frequency range
	2139	from	2n7	to	3n3	4822 122 33891	on LW from 150kHz to 279kHz
	3128	from	2k2	to	10k	4822 051 20103	
	3193	from	470R	to	2k2	4822 116 52249	

- For reasons of standardisations the headphone socket has been changed to **4822 267 40659**.
  Introduction date: Week 9336.

- To reduce residual noise the value of the motorpot has been changed to 50kΩ. (**4822 101 90248**)
  Introduction date: Week 9336.

- To iprove frequency response of the *POWER BOARD*, capacitors 2323 and 2324 have been changed to 1n5 (**4822 126 12878**).
  Introduction date: Week 9332.

- To increase the input level for the *RECORDER BOARD*, resistors 3437 and 3438 have been changed to 18kΩ. (**4822 116 52264**)
  Introduction date: Week 9332.

- **Fault:** "Ticking noise" is audible during record from CD.

  Solution: Following changes have been done on the *FRONT BOARD*.

Resistors 3405,3406 have been changed to 3k9.	Service code **4822 116 52276**.
Resistors 3437,3438 have been changed to 3k9.	Service code **4822 116 52276**.
Resistors 3605,3606 have been changed to 1k0.	Service code **4822 050 11002**.
Resistor 3609 has been changed to 1k0.	Service code **4822 050 11002**.
Resistors 3607,3608 have been changed to 1k0.	Service code **4822 050 11002**.
Resistors 3407,3408 have been changed to 270Ω.	Service code **4822 116 52217**.
Capacitor 2468 has been changed to 47µF.	Service code **4822 124 40433**.

  Introduction date: Week 9336.

- Correction to the Service Manual
  Dismantling hints - picture 6 on page 11.
  Colour of wires to the stand by LED has been interchanged from production start onwards.
  Correct is: long pin of LED connected to the grey wire
  short pin of LED connected to the black wire

- Due to cost reduction following changes have been done on the *POWER BOARD*.
  Introduction date: Week 9336.
  - Capacitors 2325 and 2326 have been changed to 100µF. Service code **4822 124 41525**.
  - The complete ***switch on mute*** circuit has been deleted. (7350, 7351, 3351, 3352, 3353, 6352, 2357)
  - Resistor 3264 has been replaced by a wire bridge.

- Except for the /21, /22 and /30 versions
  - Coils 5309, 5311, 5312, 5315 and 5316 have been replaced by wire bridges.
  - Resistors 3323, 3324, 3325 and 3326 have been replaced by wire bridges too.
  - Capacitors 2266, 2267, 2321 and 2322 have been deleted.

  (These components are only necessary to fulfil FTZ requirements.)

- Due to cost reduction pos. 501 (see exploded view of set) has been omitted. Therefore pos. 401 (side left) has been adapted.
  Introduction date: Week 9336.

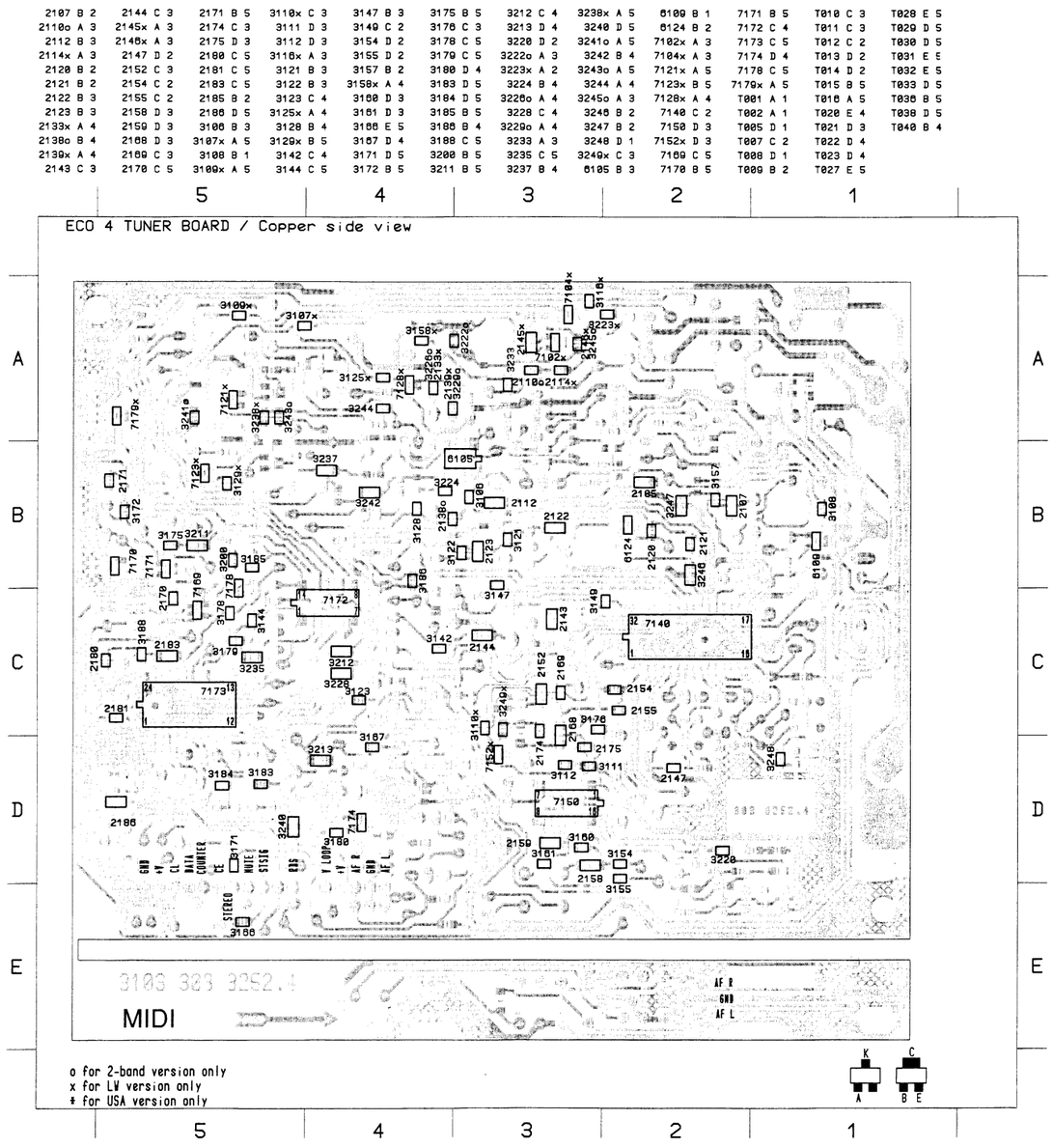
TUNER Adjustment table (ECO 4 FM/MW- and FM/MW/LW - versions with AM-ferrite antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT * 1)						
FM 87.5 - 108MHz			108 MHz	5120	1	8V ± 0.2V
			87.5MHz	check		4.1V ± 0.5V
FM /14 East Europe 65.81 - 108MHz			108 MHz	5120		8V ± 0.2V
			65.81 MHz	check		0.8V ± 0.4V
MW 2-band version, 10kHz grid 530 - 1710kHz			1710kHz	5123		9V±0.1V (7.5±0.7V) 1)
			530kHz	check		1V±0.4V (1.1±0.5V) 1)
LW 153 - 279kHz			279kHz	5122		8V±0.2V (7.5±1.5V) 1)
			153kHz	check		1V±0.4V (1.1±0.5V) 1)
MW 3-band version 522 - 1611kHz			1611kHz	5123		8V±0.1V (7.5±0.5V) 1)
			522kHz	check		1V±0.4V (1.1±0.5V) 1)
FM - RF						
FM	108MHz	A	108MHz	2115	3	MAX ↕
	87.5MHz		87.5MHz	5109		
FM /14 East Europe	108MHz	mod=1kHz Δf=22.5kHz	108MHz	2115		
	65.81MHz		65.81MHz	5109		
VCO						
FM	98 MHz, 1mV continuous wave	A	98MHz	3148	2	152kHz ± 1kHz
AM - IF						
MW	540kHz Δf = 10kHz as low as possible	100nF 50E C	540kHz	5142 5140	4	symmetrical and max height
AM - RF						
LW	198kHz	B	198kHz	5122	4	MAX
MW 3-band version	1494kHz		1494kHz	2130		MAX ↕
	549kHz		549kHz	5123		
MW 2-band version, 10kHz grid	1500kHz	mod=1kHz 30% AM	1500kHz	2130		
	550kHz		550kHz	5123		

* Use Service Test Program. By selecting the TUNER TEST, test frequencies will be stored as preset frequ. automatically.

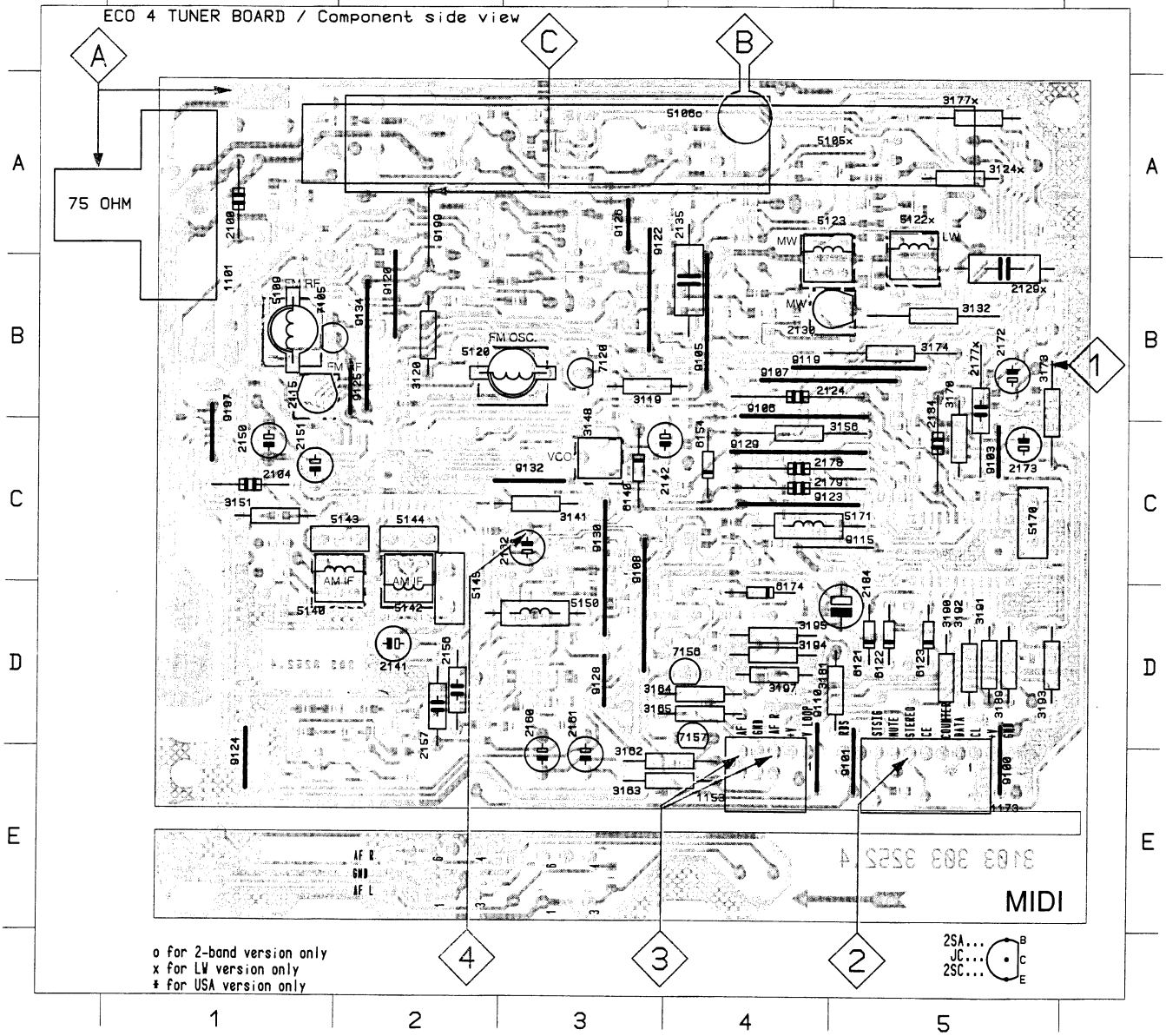
1) Adjustment of AM-RF stage influences the varicap voltage. Therefore check if varicap voltage fulfils value stated within brackets after AM-RF adjustment.

Component layout



Sypl

1101 A 1	2134 C 5	2161 E 3	3120 B 2	3164 D 4	3191 D 5	5120 B 3	5170 C 5	7120 B 3	9108 D 3	9126 A 3
1153 E 4	2135 B 4	2162 C 3	3124x A 5	3165 D 4	3192 D 5	5122x A 5	5171 C 4	7156 D 4	9110 E 4	9128 D 3
1173 E 5	2141 D 2	2172 B 5	3132 B 5	3170 C 5	3193 D 5	5123 B 4	6121 D 5	7157 D 4	9115 C 5	9129 C 4
2100 A 1	2142 C 3	2173 C 5	3141 C 3	3173 B 5	3194 D 4	5140 C 2	6122 D 5	9100 E 5	9119 B 5	9130 C 3
2104 C 1	2150 C 1	2177x B 5	3148 C 3	3174 B 5	3195 D 4	5142 C 2	6123 D 5	9101 E 5	9120 B 2	9132 C 3
2115 B 1	2151 C 1	2178 C 4	3151 C 1	3177x A 5	3197 D 4	5143 C 2	6140 C 3	9103 C 5	9122 B 3	9134 B 2
2124 B 4	2156 D 2	2179 C 4	3156 C 4	3181 D 5	5105x A 4	5144 C 2	6154 C 4	9105 B 4	9123 C 4	9197 C 1
2129x B 5	2157 D 2	2184 D 5	3162 E 4	3189 D 5	5106o A 4	5145 D 2	6174 D 4	9106 B 4	9124 E 1	9199 A 2
2130 B 4	2160 E 3	3119 B 3	3163 E 4	3190 D 5	5109 B 1	5150 D 3	7105 B 1	9107 B 4	9125 B 2	



TUNER UNIT ECO4 (MIDI)

AM/IF
FM/IF SFE10.7MS3
DISCRIMINATOR
MUTE CIRCUIT
not used in all versions
MUTE LEFT
MUTE RIGHT
MUTE
MUTE=LOW
IF-COUNT=HIGH
VERSION PROGR DIODES
Found strong signal during SEARCH
IF 200mVpp
SHIFT REGISTER LATCH
UNIVERSAL COUNTER
REFERENCE DIVIDER
PROGR DIVIDER
COUNTER
PHASE DET.
FM/AM SWITCH
VCO KILLER
SEARCH SENS
SEARCH SENSITIVITY
Tuning-Indic
L-weak sens. (Autostore 1. run)
FM OSC AMP
LOOP FILTER
STEREO DECODER
MONO=High
MONO=Low
STEREO=Low
TUNED=Low
AM=HIGH
BIRDY FILTER
FM-RF
FM-OSC
MW/LW-RF
AM OSCILLATOR
AM-WAVEBAND SWITCHING LOGIC
LOOP FILTER
PADDING
FERRITUNIT
FIXED.INDUCTIVITY
Tuned down
Tuned up
LW=high
LW=Low

Sypl

MUTE CIRCUIT

not used in all versions

MUTE LEFT

MUTE RIGHT

MUTE

MUTE=LOW

IF-COUNT=HIGH

VERSION PROGR DIODES

0V=no communications

OFF

MUTE ON

L=MUTE

L=valid signal

Tuning indic

TO/FROM CONTROL BOARD

AF.left

GND

AF.right

+V

CL

DATA

COUNTER/DATA

CE

STEREO

MUTE

STSIG

MATRIX

SYNCH DET

SOFT MUTE

SDS

CONTROL

MONOST SWITCH

LED DRIVER

MUTE

VCO

DIVIDER

19/19/38kHz

PILOT FILTER

LOOP FILTER STEREO DECODER

MUTE=High

MONO=Low

STEREO=Low

AM=HIGH

BIRDY FILTER

BC858B

FM/AM SWITCH

MM74HCU04M

FM/AM

VCO KILLER

IF

Found strong signal during SEARCH

100ms

IF 200mVpp

SHIFT REGISTER LATCH

REFERENCE DIVIDER

PROGR DIVIDER

COUNTER

PHASE DET.

UNIVERSAL COUNTER

LC7218M SYNTHESIZER

7.2MHz

Lwstab sens.

(Autostore 1. run)

TUNED=Low

SEARCH SENSITIVITY

BC848B

Tuning-indic

FM OSC AMP

2SC1047

AM OSCILLATOR

PADDING

Tuned down

Tuned up

LOOP FILTER

AM-WAVEBAND SWITCHING LOGIC

MW/LW

LW/MW

LW=Low

LW=high

Weak signal

Strongsignal

152kHz 150mVpp

stereo mono stereo

STABILIZING CIRCUIT +5V

BZX79-F5V1

HEF 4069 UBT

MM 74HCU04M

GND

HN1V02H

VERSION PROGRAMMING DIODES

	6121	6122	6123
FM, MW, LW EUROPE			
FM, MW, LW EAST EUROPE	X	X	X
FM, MW USA /17	X		X
FM, MW OVERSEA /01		X	
FM, MW, LW, SW	X		
FM, MW, SW	X	X	

X=DIODE MOUNTED

o for 2-band version only

x for LW version only

* for USA version only

1101 C 2	7150 A13
1153 C30	7150 C14
1173 D30	7150 B14
2100 C 2	7150 B13
2104 C 4	7152x I12
2107 I 8	7156 B16
2110x N 4	7157 C15
2112 N 6	7169 K18
2114x N 4	7170 O17
2115 J 7	7171 O17
2120 K 8	7172 H16
2121 K 8	7172 D20
2122 K20	7172 O20
2123 K20	7172 N22
2124 K22	7172 N20
2129x O12	7172 O22
2130 N12	7175 H24
2133x N15	7174 D17
2134 I22	7178 K16
2135 N14	7179x O18
2138o N14	9197 C 3
2139x O15	9199 J 6
2141 C10	T001 C 2
2142 G13	T002 D 2
2143 G13	T005 O 4
2144 G14	T007 D 6
2145x O 5	T008 D 6
2146x N 4	T009 G 6
2147 C 9	T010 H10
2150 H 7	T011 H10
2151 H 6	T012 C 8
2152 H10	T013 C11
2154 C11	T014 B11
2155 C11	T015 M16
2156 B12	T016 I29
2157 C12	T020 B29
2158 C13	T021 C29
2159 C14	T022 C29
2160 B15	T023 C29
2161 C15	T027 D30
2162 I10	T028 E30
2168 I10	T029 E30
2169 I10	T030 E30
2170 O17	T031 E30
2171 N17	T032 F30
2172 M17	T033 F30
2173 M17	T036 O17
2174 I10	T038 F22
2175 K10	T040 J16
2177x O18	
2178 I21	
2179 I21	
2180 H25	
2181 G25	
2183 I23	
2184 I29	
2185 L 8	
2186 F26	
2193 J16	
3106 L 7	
3107x P 5	
3108 K 7	
3109x O 5	
3110x I12	
3111 J10	
3112 J11	
3116x L 4	
3119 K21	
3120 L 8	
3121 K20	
3122 K21	
3123 N20	
3124x O 8	
3125x O15	
3128 M15	
3129x O13	
3132 M12	
3141 D18	
3142 G14	
3144 H18	
3147 I 9	
3148 J 9	
3149 J 9	
3151 C 4	
3154 B12	
3155 C12	
3156 D19	
3157 I 7	
3158x O 2	
3159 G13	
3160 C13	
3161 C14	
3162 B15	
3163 C15	
3164 B16	
3165 C16	
3166 F27	
3167 J29	
3170 N18	
3171 F29	
3172 N17	
3173 M16	
3174 M16	
3175 N17	
3176 K10	
3177x O18	
3178 J17	
3179 I17	
3180 C18	
3181 C18	
3183 E22	
3184 E22	
3185 J17	
3186 J16	
3188 H25	
3189 E29	
3190 E29	
3191 E29	
3192 E29	
3193 M18	
3194 G31	
3195 H31	
3197 H31	
3200 K17	
3201 I23	
3220 J14	
3222o P 3	
3223x N 4	
3224 M14	
3226o N14	
3229o O14	
3233 M 5	
3238x N 9	
3241o O11	
3242 M11	
3243o N10	
3244 M 9	
3245o N 4	
3248 C 5	
3249x I11	
5105x P 2	
5106o O 3	
5109 I 7	
5120 J 8	
5122x O10	
5123 N10	
5140 A 5	
5142 A 8	
5143 D 7	
5144 D 9	
5145 C10	
5150 I10	
5170 G25	
6105 O25	
6109 J 7	
6121 E21	
6122 E21	
6123 E21	
6124 K 8	
6140 I 9	
6154 D18	
6174 I29	
7102x P 4	
7104x N 5	
7105 I 7	
7120 L20	
7121x O 8	
7123x O13	
7128x N15	
7140 E 5	
7150 J14	
7150 J11	